THE CONDOR

A Magazine of Western Ornithology

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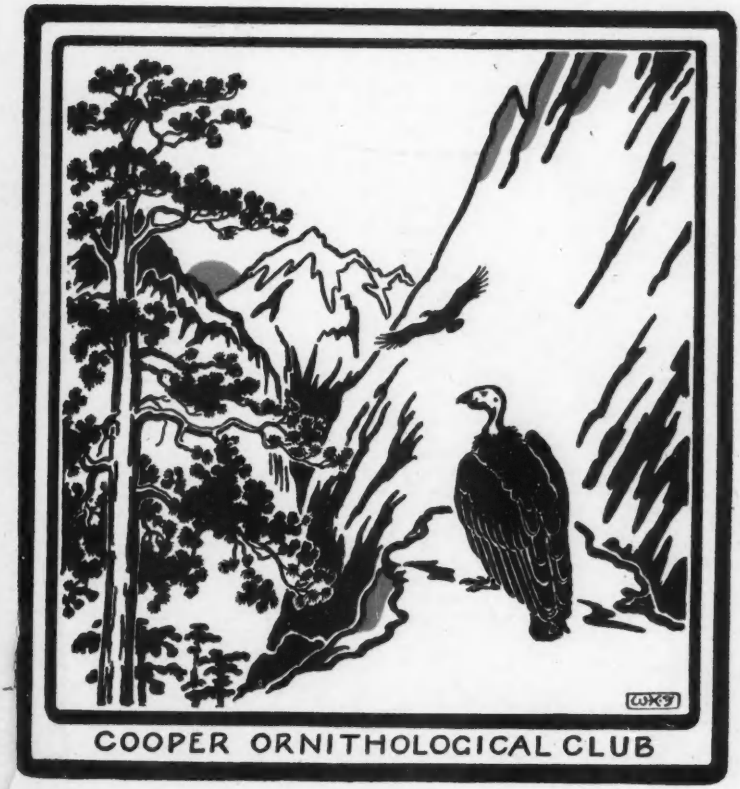

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VOLUME XXXVIII JANUARY-FEBRUARY, 1936 NUMBER 1

NESTING OF THE SIERRA NEVADA ROSY FINCH

WITH THREE ILLUSTRATIONS

By JAMES B. DIXON

The Sierra Nevada Rosy Finch (*Leucosticte tephrocotis dawsoni*) is a fairly common breeding bird in the higher mountains on both sides of Mammoth Pass, in the Sierra Nevada of California. Observations extending from June 12 to July 17, 1935, by the writer assisted by Charles Schnack, James Hanson, Ralph Dixon, and James Dixon, Jr., are incorporated in this article along with a few made previous to 1935. The data given herein were gathered within twenty miles of June Lake, Mono County, and at altitudes ranging from 7500 to 12,000 feet.

Early in June, 1934, a severe snow storm drove large numbers of Rosy Finches from the higher elevations to the eastern base of the mountains at the 7500 foot level. After this we were sure that the birds bred close by, and we determined to become better acquainted with them. Our first attempt to find breeding grounds was made by Ralph Dixon and Charles Schnack, on June 16, 1935, when they made a trip to the higher parts of San Joaquin Peak. Here at 9500 to 12,000 feet the ground was blanketed with snow and observations were difficult because of the hard going and the prevailing high winds. However, one bird was seen feeding on the snow near a likely looking cliff. On this trip another prospective cliff higher on the peak was seen and both of these cliffs subsequently proved to be breeding locations of colonies of Rosy Finches. (See fig. 1.)

Both cliffs were of black basaltic rock and had heavy snowdrifts above and below them. They faced into the setting sun and were one-quarter and one-half mile long. Each varied in height from 100 to 150 feet, and the talus slope under each extended for a long distance. Only the vertical or overhanging portions of these cliffs were free of snow. The large number of niches, cracks and benches on these cliffs ensured many suitable places for nests.

On June 22, another inspection trip was made to the lower cliff and birds were heard chirping to each other somewhere on the face of it, but they could not be located. Several birds were noted flying along the cliff but no nests or signs of nest building were seen. Observations, even at this late date, were difficult because of the glare of the sun on the snow, the speed of the flight of the birds due to the high velocity of the winds, and the general difficulty of keeping in sight such small birds amid such vast surroundings.

At this time males were making overtures toward females, but in every instance they were repulsed. One female flew into her mate with such force as to cause

feathers to fly. Through binoculars the male birds could be seen going through the motions of singing, but the roar of wind and water nearby drowned out the sounds. Several pairs were feeding in the snowdrifts below the cliff. At this stage of the thaw, birds are much harder to locate than later in the season when their feeding grounds are more clearly defined.

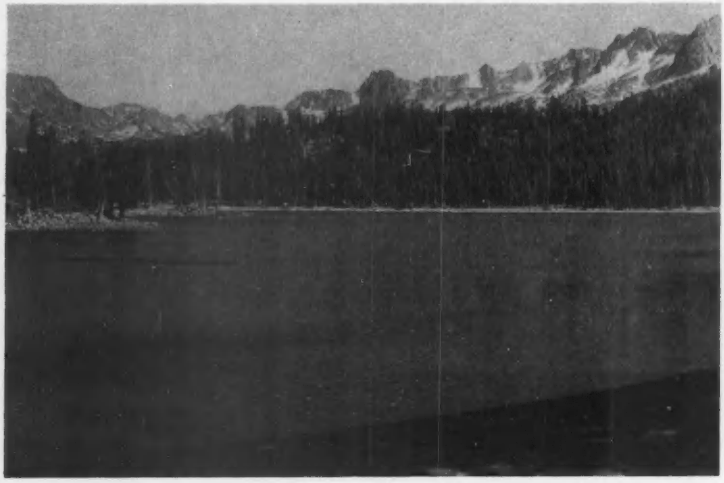

Fig. 1. Horseshoe Lake, Mono County, California, showing in distance the cliffs in which Sierra Nevada Rosy Finches nested; photographed July 11, 1935.

By the next trip, on June 30, conditions surrounding the cliffs had changed considerably. The steep talus slopes were appearing from beneath the snow and a closer inspection of the cliffs could be made with less danger from falling snow and rocks. Six pairs of birds were watched and either the exact nesting site found or the nesting areas were definitely outlined. In two locations females were incubating and in another a female was building a nest. Clark Nutcrackers (*Nucifraga columbiana*) were carefully searching over the cliff face for something, and chipmunks were also seen scampering around on the cliff. During the daytime portions of the cliff face would be dripping with water from the thawing snow banks on top and a close inspection proved that these areas were covered with ice which apparently formed during the night and did not entirely thaw out during the day. Moss was growing on warm ledges in these areas, and later these areas were veritable hanging gardens of moss and other greenery.

The ice-covered areas were chosen by the Rosy Finches in every instance for nesting locations. The nest sites were selected by the female and she also did all the building. The male gave only moral support, but also watched out for Nutcrackers. He would fly back and forth with his mate but kept his distance; for the builder would tolerate no assistance from him. We came to the conclusion that the finches selected these places for their nests as a means of protection from their enemies, the Nutcrackers and chipmunks, which were afraid or disliked to go into them.

Our observations at nine nesting sites indicate that the female rules with an iron hand during the period of nest building, egg-laying, and incubation; only after the young are hatched does she allow the male to take the initiative. The male does more than half the feeding of the young; their care seems to be more in his hands than in the female's. The female would discourage in every way the male from making himself noticeable around or near the nest prior to the hatching of the young.

During nest building the female exercised no caution in approaching the nest and paid little attention, if any, to anything except building her nest as quickly as possible in the place she had selected. After egg-laying, and particularly after incubation had begun, this condition changed. After incubation had begun, the female upon leaving the nest would drop vertically to the lower part of the cliff and then change her course to suit the direction of her destination. In returning to the nest extreme caution always was exercised. Usually the approach was made from level with the nest or slightly higher; and alighting first some distance from the nest the bird would carefully look the situation over and would then fly about half way to the nest and repeat the performance. If satisfied that the coast was clear she would then fly directly to the nest and enter with hardly a wing flutter to indicate where she had disappeared. In no instance did we see the male feed the female either on the nest or near it.

Our observations thus indicated that the female did all the incubating, leaving the nest through the day at regular intervals to secure food. Actual timing on warm days indicated forty-five to fifty minute incubation periods and fifteen minute feeding periods. When the female was off the nest she visited the same forage area time after time. During thawing hours she and her mate would feed around the margins of snowdrifts, but early in the morning they would feed in bare spots and in the lower parts of scrubby trees.

Close observation indicated a wide variety of food, the principal part of which was obtained from the edges of snowbanks and consisted of seeds, termites, lady-bird beetles and small black articles too small to identify. The birds were quarrel-some on their feeding ground and resented any intrusion by any other birds; any trespassing resulted in a battle. Almost the same feeding route was followed time after time, and, noticing this, I stationed myself at some distance from a feeding female but on her route as previously observed. She fed up to within a few inches of my feet and after looking me over casually passed around me. The two birds of a pair would feed in separate places but close to each other. They seemed to keep in touch with each other by twitterings and always signalled upon leaving.

One female, watched on four round trips between the feeding ground and nest, alighted every time upon the dead branch of a blasted small pine and from this perch began her regular round on the route previously selected. This was done in other instances too, and the flight from the feeding ground to the nest time after time was the same, but on account of wind it was not always in a direct line. At one place four pairs feeding within chirping distance of one another seemed to talk back and forth, but any straying away from the regular feeding ground of any pair was the signal for a battle, and round and round they would go so fast in flight it was hard to follow them; and then, in a flash, the whole group would return and go to feeding as though nothing had occurred. Apparently the birds feed down the slopes early in the season and as the thaw line rises the feeding areas are changed to places above the nests.

On July 7, we packed our ropes and rope ladder to the lower cliff, upon which

we had located six nesting sites and at close range proceeded to investigate three of them. (See fig. 2.) The first was about the middle of the cliff behind a slab of rock which had separated from the cliff face but still remained attached. The nest was found in a small recess behind this slab. It held one punctured egg and one

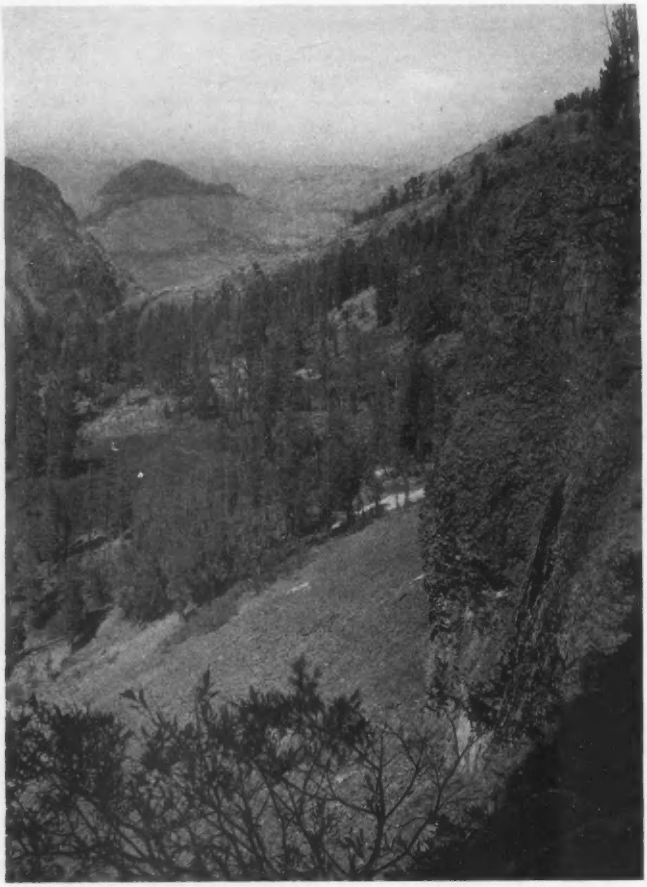

Fig. 2. Cliff (at right, looking north) from which set of four eggs of Sierra Nevada Rosy Finch was taken July 7, 1935.

newly hatched young bird which had been killed and left in the nest. We felt sure this was the work of Nutcrackers, as we had seen them working this part of the cliff apparently looking for nests, and we presumed they had done away with the rest of the eggs or young.

The next location was on a sheer face in an open niche about forty-five feet down from the top and contained four young birds estimated to be four days out

of the shell. All of these birds were in good shape and ten days later they were out of the nest being cared for by their parents near-by. The next location was back in a hole in the wall only about fifteen feet from the top of the cliff where it was badly cracked and fissured. This nest was being built on our visit on June 30 and now held four eggs in which the incubation was slightly advanced (fig. 3). We previously had noticed Nutcrackers fluttering around the entrance to this nest and thought it probably had been destroyed.

The nests studied are much alike as to materials used, being well made of wet moss at the base and sunk flush with the surrounding moss if possible, and lined with dry grasses and feathers. The bases and surroundings of nests under construction were so wet as hardly to seem habitable. If the nest location will not allow the nest to be sunk flush with the surrounding moss, an approach of wet moss is built.

Fig. 3. Nest and eggs of Sierra Nevada Rosy Finch removed from rocks; collected July 7, 1935, as described in accompanying article.

Believing the nest containing four eggs to be typical, we made the following measurements of it: Outside diameter, 4½ inches; inside diameter, 2½ inches; outside depth, 2¾ inches; inside depth, 1½ inches. Average size of the four eggs in inches is .62 x .92.

The other locations on the cliff were not visited because the birds were feeding well grown young. Fecal sacs were being dropped by the parent birds some distance from the nests.

With the information we had secured at the lower cliff we made an effort to find nesting places on the cliff which was at a higher elevation. We felt it would show later nesting dates. We had no particular difficulty in finding nests here; but we found conditions much the same as at the lower cliff, and some of the young were out of the nest at this date. We also tried another location some distance removed and under the proper conditions everywhere found nests. We failed to find any evidence of nesting in a moraine.

On July 11, a nest was found and the bird was busy building, at about 3 p. m. She was like the previous bird we had found building, as regards lack of attention to our presence. We returned to this nest on July 15, to take pictures and to make

some experiments with the incubating birds. The nest was in an exposed location almost at the base of the cliff and only a short distance from other occupied nests. By building a short ladder we were able to inspect it without using ropes. Efforts to flush the sitting bird by dangling a tin can full of small rocks in front of the nest and shaking the can vigorously, by throwing rocks against the cliff face near the nest, and by shooting a small calibre rifle bullet against the cliff face near the nest, failed. Finally a rock was rolled down the mountain-side. This brought the bird out at once, but only long enough to see where the rock was and to ascertain that it would do her no harm, whereupon she returned at once to the nest; and she did not flush again until we climbed up to take pictures.

This nest held five fresh eggs. It differed in shape from, and was slightly larger than, the first nest collected. It measured as follows: Inside diameter, 2¾ inches; outside depth, 2½ inches; inside depth, 1½ inches. A landing platform 3 inches long extended from the nest to the edge of the ledge that supported it. Average size in inches of the five eggs is .60 x .83.

In the protection of their nests Rosy Finches seem to rely mainly on the exercise of caution as indicated by the fact that whenever a Nutcracker came in sight all activities on the part of the finches ceased and were not resumed until the Nutcracker passed out of sight. No effort on the part of the finches was ever made to harass the chipmunks that were seen often on the cliff. As an indication of their success in keeping the locations of nests a secret during the incubation period, we were unable to find a nest while it held eggs, but found all our nests while under construction or else after the young had hatched and were being fed.

Apparently the birds colonize for the protection it gives them in sounding alarms to indicate the approach of enemies. In all three places we found the birds nesting under the same peculiar conditions and always in groups of six pairs or more. None of the nests found was so located as to require the removal of any rock or material of any kind in order to inspect it.

The young birds did not stay in the nest over ten days, and the parents seemed anxious to get them out and hidden away in the rock piles near-by, only one young bird in a place. In several instances we flushed young birds from the rocky slopes under the cliffs and soon the parent bird would appear with food and go to the place where the youngster had been left and give the usual note which would be answered by the young bird. The parent would then coax the youngster into a new hideout before feeding it. During this phase of the rearing of the young the male is much more in evidence and feeds about twice to the female's once.

The following possible enemies seen in the vicinity of the breeding grounds are listed in order of their importance: Clark Nutcracker, Chipmunk, falling rock and snow, Prairie Falcon, Sharp-shinned Hawk, Western Goshawk, and Saw-whet Owl.

Escondido, California, August 1, 1935.

SOME MARITIME BIRDS OBSERVED OFF SAN DIEGO, CALIFORNIA

WITH MAP

By LOYE MILLER

During the months of July and August, 1935, I enjoyed certain special advantages for the study of maritime birds along the coast and on the offshore waters of southern California. Part of my good fortune resulted from the cooperative spirit at the Scripps Institution of Oceanography whereby several trips were made possible that at various times sectioned the waters between the Coronados Islands and Tanner Bank on the south, and Catalina Harbor on the north. (See fig. 4.)

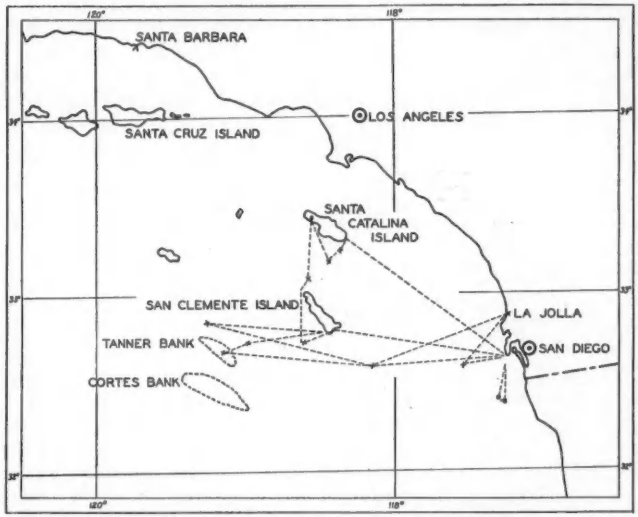

Fig. 4. Sketch map, showing routes traversed during the trip described in the accompanying article.

Thanks are due Director T. Wayland Vaughan, acting Captain Eric Moberg, Oceanographers Richard Flemming and Roger Revelle, and the very obliging engineer and helper of the launch "Scripps", Messrs. Ross and Wilkes. These excursions were made between regular observation "stations" of the program of oceanographic study now under way at the Scripps Institution, but every facility was offered the ornithologist as well. An attempt was made to determine what relation might exist between the physical conditions of the sea waters and the food supply, and which possibly controls the distribution of the birds. Some progress was made in this field, but conclusions should be drawn only after a long period of observation a mere beginning of which has been made. In the meanwhile, many interesting items of information were gained which pertain to the regular movements and the numbers of certain species, items that should be made available to the great host of western bird students as soon as practicable.

Observations began July 12, along the beach from Carpinteria southward through Hueneme, Point Mugu, Malibu Coast, La Jolla, San Diego Bay, Mission Beach,

and Imperial Beach, almost to the Mexican line. All of July 23 was spent in working stations along a line extending fifteen miles west and slightly south of Point Loma. July 29 to August 2, we ran west to Tanner Bank, back to Smuggler Cove at San Clemente, out again to the west and thence north to Catalina Harbor, thence back to the north point of San Clemente and across the channel to Avalon, thence directly to San Diego. In this way the seaward side of the islands, the waters over the bank, the inter-island channel, and the inner channel were sectioned.

Nearly a month later the southern waters were again sectioned as follows: August 22, San Diego to Coronados Islands and return; August 24, the same; August 28, out fourteen miles west and return; August 29 to 31, fifty miles WSW to a point north of Tanner Bank, back to anchor at Smuggler Cove, San Clemente; thence back to San Diego.

The interval of approximately thirty days between visits to the several regions worked the following changes: Red Phalaropes gave place to Northern Phalaropes; adult Western Gulls along the mainland shore were diluted by an influx of young birds; Least Terns became fewer and Forster Terns appeared abundantly. Black Terns were captured offshore; shearwaters decreased in numbers; Brown Pelicans formed flocks of five to twenty individuals, most of them dull plumed birds; shore birds became more numerous; Snowy Herons appeared; migrating land birds were seen far offshore; petrels increased in numbers.

Outstanding items include: Red-billed Tropic-bird thrice seen at widely separated stations, one of them in Mexican waters near Los Coronados Islands; two Frigate Birds were seen soaring over La Jolla; one Least Petrel and one Wilson Petrel were collected and Black Petrels were seen "rafting" by the thousand; Black-footed Albatrosses were seen on each trip outside the channel waters and once within twelve miles of Point Loma.

The following list of species includes only those which were considered worthy of note because of date or locality.

Diomedea nigripes. Black-footed Albatross. From 1894 to 1899, this species was a familiar companion of my journeys by steamer to and from San Francisco. We never saw them in the Santa Barbara channel, but they picked up our vessel as soon as we reached open water at Point Conception. Numbers were always in sight especially in the wake of the ship as the galley refuse was hove overboard. The plumage showing whitish upper tail coverts seemed to be the dominant one and I supposed it to be normal for the adult. Later, I found from Loomis' studies (Proc. Calif. Acad. Sci., ser. 4, 2, pt. 2, 1918, pp. 1-187) that such was not necessarily the case, though the final word was not pronounced.

All four birds collected this summer, and all others coming sufficiently close to the ship, were of the dark phase. All collected were females, and three of the four had post-breeding ovaries.

During the month of March, 1904, an excursion was made on the U. S. Fisheries vessel, "Albatross", to the continental shelf west of San Diego on the meridian of Point Conception. Here the Black-footed Albatross was found to be common both night and day. On deck at ten o'clock at night one could look out over the faintly lighted water and see the birds at their endless circling. My notes at that time bear the question, "Do they feed on phosphorescent forms?" The presence of squid beaks in all four stomachs examined (in 1935) would support such a possibility.

My next contact with this species was twenty years later. In 1925, en route from San Pedro to Central America, we were followed by the species as far as Mag-

dalena Bay. Rarely were there as many as two birds in sight at one time. The contacts of last summer, ten years still later, indicate a greater abundance than in 1925, but far less than in 1904. As many as three birds were in sight at one time and there was no concentration of numbers due to galley waste. Curiosity may have prompted them to come near the launch, but they did not follow us. We hove to, for oceanographic work, sometimes for hours at a time. On one such occasion, I manned the skiff and repeatedly rowed to within a boat's length of birds sitting on the water; they would flush if approached more closely. During the following day only four Albatrosses were seen. We were then on the seaward side of San Clemente, though perhaps too close inshore.

On August 2 we took a direct route from Avalon Bay to San Diego. In the first sixteen miles three Albatrosses were seen and none the remainder of the way. The greatest number seen on any one day was seven, all in the general region of Tanner Bank, southwest of San Clemente.

Birds were repeatedly seen to settle on the water and pick up some sort of food not derived from our launch. Stomach examinations showed beaks and eye lenses of squid, great masses of fish eggs, bones of some good-sized fish, and sizable bits of brown seaweed. These latter may have been torn off in feeding upon fish eggs that were held together in strings of tough secretion; but one kelp mass was the growing end of a plant, and could not have been the anchorage of an egg cluster. There appears to me no reason why these omnivorous birds should not pick off kelp fronds; for one of them had swallowed a quantity of boiled cauliflower thrown out from the galley. Its stomach was crammed with fish eggs too, indicating that it was not driven by acute hunger. The fish bones probably came from floating carrion, since it seems doubtful if the bird could capture a healthy fish of such size.

Much has been said of the degree to which birds of the genus *Diomedea* are dependent on brisk winds for their flight. The species under discussion does not appear so to be. During our exploration, the wind was almost negligible, but the birds came bowling across the sea, close to the surface, flapping and soaring like gigantic shearwaters, but with, of course, a slower wingbeat.

The four individuals collected were measured while warm. The wings extended 82, 81, 81 and 77 inches. The virgin female measured 81 inches and the smallest bird showed signs of having produced eggs.

No other bird of the albatross group was seen during the summer. In fact, during the forty odd years of my acquaintance with *D. nigripes* along the California coast, no other species has been recognized. Willett gives an excellent paragraph on the Short-tailed Albatross (Pac. Coast Avifauna no. 21, 1923, p. 14) in which he expresses the fear that it is now an extinct species. I am inclined to feel the same way regarding it. I have personally collected many bones of *D. albatrus* in kitchen middens of the coast Indians, but never have I seen the bird in life. On the other hand, *D. nigripes* is, I believe, increasing in numbers from a low ebb of a decade or so past.

Puffinus griseus. Sooty Shearwater. This species was the dominant shearwater, as was to be expected. Only one concentration of numbers was seen. On July 31, just west of San Clemente Island, a loose raft of perhaps two hundred birds was encountered as they sat quietly on the surface of the water in early afternoon. At other times during July, birds were well scattered and in all cases were flying northwest along the Catalina channel. On August 1, in the channel between San Clemente and Catalina islands, we passed for some miles through schools of small fish that broke surface to right and left of us like small grasshoppers, but not a shearwater was seen in the region.

Puffinus creatopus was seen much less frequently. A fresh carcass of this species was picked up July 12, at Hueneme Beach. Other shearwaters were not recognized.

Fulmarus glacialis rogersii. Pacific Fulmar. Both light and dark phases of this bird were seen at Tanner Bank. One of them was harried for a moment by a Parasitic Jæger.

Oceanodroma melania. Black Petrel. During the entire summer, petrels were subjected to careful observation, and constant watch was kept to see if any environmental factor could be discovered that had a controlling influence upon their distribution. Altogether insignificant results must be confessed. It is true that we never met them within four miles of the mainland, although a colleague reported seeing one off the end of the pier at Scripps Institution at La Jolla. Again there was some evidence that colder waters were more favorable. On two occasions at least, we passed from water of a surface temperature of 14.5 C. to 19.5 C., and the number of birds decreased markedly. These cold areas are presumably due to upwelling of deeper waters, and in one case that we tested, a greater concentration of zoöplankton in the cold water was reported by Dr. Martin Johnson of the Scripps staff. In other places this factor failed to be effective. On the run from Avalon Bay to San Diego, petrels all at once became abundant when we got into the current around the south end of the island. During a run of eight miles in this region, forty-three petrels and twenty other offshore birds were seen. Then suddenly we were without birds and in the next hour a run of eight miles produced only ten petrels and five other birds. Apparently we had passed out of the swirl about the end of the island.

Like the albatrosses, petrels kept on the wing at least as long as the light was sufficient to see them and, while we rode at anchor at San Clemente, they were about the ship at various hours of the night—a phase of behavior well known to those who have met petrels in life.

Birds were repeatedly seen to settle and feed on the surface, but in only a few stomachs could I see other than the pinkish, oily fluid which is so readily ejected by a captured bird. Tiny fish scales and what appeared to be parts of small squid were the only tangible objects observed.

The Black Petrel was the species most in evidence, though one white-rumped bird was seen ten miles north of Tanner Bank. Occasional birds observed seemed to have a quicker wing beat and probably were the smaller Ashy Petrel. Constant effort was made during the summer to collect petrels for identification as well as for specimens, but none was obtained until the last twenty-four hours, when four species and thirty-nine individuals were taken.

The most surprising observation made on the petrels during the entire summer was that they sometimes raft, like shearwaters, in countless numbers. This was discovered on the last day out, August 31, twenty-five miles off San Diego on the direct run from San Clemente Island. My notes on the subject run as follows: "About mid-channel petrels became slightly more numerous and we hove to for a try at 'chumming', for I wanted to identify the birds. One or two came to our 'chum', of suet, but would not allow us to approach. Birds became more numerous still at about thirty miles when six were seen on the water in a compact group. We put the ship over toward them and they left. Soon thirty birds were noted in another group, but they also left.

"Shortly afterward, we saw ahead of us great rafts of birds on the water, much as shearwaters raft. In fact they were supposed at the distance to be shearwaters. They made black patches like kelp flies so close together as to be inseparable to

the eye. Some rafts were 100 yards long and several rafts were visible at once. They allowed no near approach with the ship, but one white-rumped bird flew near enough to us to be collected by Dr. Richard Flemming. Finally I proposed trying an approach in the skiff. We thus came close enough to a small raft for a double barrel discharge with too great success; we picked up thirty-seven birds." All but one of these were of the one species *O. melania*. All were adult birds with gonads showing quite recent activity. Testes were large, white and translucent. Ova were very distinct and in one bird a single ovule had a diameter of two millimeters. The species breeds only south of the California coast waters, so these individuals represented a post-nuptial surge to the northward, quite free of juvenile influence. They were quite fat, but not of the excessive fatness found in many sea birds. Mouth linings and tongue were chrome yellow; eyes and feet entirely black.

I have nowhere found mention of rafting among the petrels; hence this great assemblage which must have aggregated many thousands proved quite a surprise. Surface thermometers and surface planton nets were put out in the immediate area, but no unusual conditions were evident. Dawson (Birds of California, **4**, 1923, p. 2003) ascribes the congregating of Sooty Shearwaters to local food supply, but no such factor was detected here.

Oceanodroma homochroa. Ashy Petrel. On the nights of July 29, 30, 31, August 1, and 30, while at anchor near San Clemente or Catalina Island, flood lighting for petrels was tried. No birds of any sort came to the light until August 30, when quite a number of species including the Ashy Petrel were attracted to the ship.

Petrels were the only ones that actually came on board, and only two were captured. In late March, 1904, while anchored at Santa Barbara Island, we were visited by dozens of Ashy Petrels. They came into the ward room and into the engine room, flapping bat-like down into the very depths of the ship "Albatross." We were probably quite near a colony preparing to nest. The several efforts of the late summer of the present year probably yielded so little result because of the remoteness from any such colony. The meager success of August 30, when several other species were identified, may have been due to post-nuptial dispersal that brought them to Smuggler's Cove, San Clemente Island.

Halocyptena microsoma. Least Petrel. A single specimen of this species was picked up with the great number of Black Petrels discussed above. The locality was twenty-five miles WNW of Point Loma on a direct line from the southern end of San Clemente Island. It is an adult female. The locality given for the Sefton specimen in the San Diego Society of Natural History collection is, "500 yards north of the whistling buoy, San Diego." Our specimen is, then, the northernmost record of the species for California.

Oceanites oceanicus. Wilson Petrel. The single white-rumped bird collected from the general petrel swarm after flushing one or two rafts was of this species. The extremely long legs were at once striking. The yellow webs between the toes, brown irides, and white dashes on the upper secondary coverts complete the identification. Whether the white-rumped bird seen off Tanner Bank on July 30 was of this species is doubtful. The date was a month earlier and the locality farther out to sea on about the same parallel of latitude. It was more probably a Keading or a Socorro Petrel. The record specimen of Keading Petrel from California was taken in 1904 close to that point.

Phaëthon aethereus. Red-billed Tropic-bird. Willett finds but one record of this species from California waters (Law, Condor, **21**, 1919, p. 88) from about

midway between Catalina Island and Long Beach (specimen taken). Our party saw the species at three rather widely separated localities, two of which were in California waters. All were sight records, but the identity is to me unquestionable. On one occasion, between San Clemente and Catalina islands, the bird flew directly over the ship. The flowing tail feathers, postocular dark area, and heavy tern-like bill were plainly visible.

On another occasion, a month later, an individual was resting on the water and the man at the helm nearly ran it down. I was on the afterdeck and saw it come into view as it flew almost from under the bilge of the ship. Specific identification was unquestionable. The third time, I was occupied with a basking sun fish and did not see the bird as it flew over; but Dr. Flemming, who had met the species in Central America, described it accurately.

Bancroft implies that the Tropic-bird is not able to rise from the water and take wing (Condor, **29**, 1927, p. 191), but this last bird did so in foggy calm weather with the least perceptible breeze only. My experience with the Yellow-billed Tropic-birds in Hawaii was that they repeatedly settled and rose again from the water. There, however, a brisk trade wind blows almost constantly.

Fregata magnificens. Man-o'-war-bird. There are numerous records of these birds from our coast and even, rarely, from the interior, but my own first record from American waters was of two birds sailing high over Scripps Institution, La Jolla, on August 29. They were not near enough for recognition of the plumage phase.

Ardea herodias hyperonca. California Blue Heron. On July 12 these birds had not yet arrived at Point Mugu where they later became so abundant. A month later they were common along the several coastal areas.

Egretta thula brewsteri. Western Snowy Heron. These little egrets first appeared at San Diego Bay on July 25.

Melanitta perspicillata. Surf Scoter. One raft of these ducks in high plumage was seen at Point Mugu on July 15.

Squatarola squatarola. Black-bellied Plover. On July 22 at La Jolla, the first two birds were seen. One in full summer plumage was being persistently followed from stone to stone by a slightly smaller bird with dashes of black on the belly. Was this a persistent sex reaction? Numbers increased but slowly. However, on September 21, the beach of Hyperion, Los Angeles County, was swarming with the birds; literally hundreds of them were seen along the strand for some miles. All were in complete dull plumage.

Arenaria interpres morinella. Ruddy Turnstone. A single bird came on board, but soon left us, at San Clemente Island, July 31.

Arenaria melanocephala. Black Turnstone. This species suddenly became abundant at La Jolla on August 25.

Phalaropus fulicarius. Red Phalarope. From July 23 to August 1, this species was the only phalarope noted. It was abundant offshore as far out as we went. On August 22, when I returned after a two weeks absence, they had seemingly all passed onward. Quite in contrast was the migration of 1934 when this species was very abundant along the southern California coast, well into October. Sick birds and emaciated bodies were cast up in numbers along the strand.

Lobipes lobatus. Northern Phalarope. On August 2 three birds of this species were seen off Point Loma. Two weeks later they had replaced the Red Phalaropes on the open ocean and they continued abundant through the two more weeks that I was able to spend in observation.

Larus occidentalis wymani. Wyman Gull. Comment has been made earlier in this paper on the almost complete absence from the mainland, of first year birds during July. The young of the year began coming in during late August. My greatest surprise was to find the species breeding on the cliffs at La Jolla. I was counting Brandt Cormorants in the well established breeding colony over the famous La Jolla caves. I had just made a count of 110 birds perched at one time on the cliffs when I saw an adult Wyman Gull fly up to a ledge and begin feeding a half-fledged nestling. The nest was located near the west end of the rookery of cormorants, and the young bird was easily seen with the field glasses. The body plumage was still largely down and the wing quills about half grown.

Another pair of gulls kept flying up to the cliff, but no other nest was located. The date was July 21.

Larus heermanni. Heermann Gull. The first Heermann Gulls of the season were seen on July 12 along the beach below Carpinteria; about fifteen individuals, all in full summer plumage, made up the group. One other flock of adults was seen along the Malibu coast on the same day, but the species was not met again until late in August when young birds, and those in full winter plumage only, were seen. During the last week of August, birds of this species were repeatedly watched harrying Forster Terns almost in the style of Jaegers. The terns were, however, always able to outfly the clumsy gulls. Pelicans were repeatedly worried, but in no case did I see the gull obtain a fish. The Pelican would keep his beak half submerged and turn quickly away from the importunate gull until the fish was in a position to be swallowed by a quick jerk of the head.

Sterna maxima. Royal Tern. These terns surprised me by appearing in San Diego as early as July 21. They kept well inshore at Pacific Beach and La Jolla, and did not go beyond the kelp beds at the harbor mouth. On our out-bound movements we found them fairly abundant till we got into the swell of the outside waters when they dropped away from us only to be met about the same place on our return. Even the crowded inner harbor with all the naval traffic of large and small craft, all the hydroplanes from Spanish Bight, in addition to the commercial traffic, seemed much to their liking; for they were fairly abundant even there.

Sterna antillarum. Least Tern. At the San Diego Yacht Club where our vessel generally lay while in port, birds of this species were feeding their brown-backed young during the week of August 20 to 27. They seemingly had nested on the narrow spit that had been thrown up by dredges in the region of Beacon 3 Shoal of my earlier experiences. This area is now permanently above water and is beginning to support beach vegetation. The Least Terns were carrying fish to this spot in late July, though no nests were discovered by me.

My collecting experiences with Mr. George Willett off the San Pedro Harbor mouth caused me to keep close lookout for Arctic Terns outside San Diego Bay, but no terns of any sort were seen outside except one flock of Black Terns (*Chlidonias nigra surinamensis*) from which a bird of the year was collected August 28, nine miles off Point Loma. The birds acted like petrels, flying within three or four feet of the water. In fact, they were mistaken for petrels at first.

Brachyramphus hypoleucus. Xantus Murrelet. I was disappointed that so few of these birds were seen. We were certainly in their territory about the islands and in the channels. Their feeding time at sea is the daylight period; still we saw very few considering the amount of sea surface patrolled. Just as noted by Dawson (Birds of California, **3**, 1923, p. 1491), they generally occur in pairs and they take wing before being closely approached. The only specimen collected was not

feeding upon invertebrates, a habit suggested by Dawson, but it contained several small fish. The beak of the species seems hardly that of a fish-eating bird.

Zenaidura macroura marginella. Western Mourning Dove. Great was my surprise to find this species on three occasions far offshore. Fifteen miles south of San Clemente Island, at dawn on August 30, two of these birds were discovered circling our boat, apparently attracted by our riding lights. They did not come on board, but remained about till the light increased, when they resumed their journey, presumably toward the Mexican shore. The following day they twice visited us near mid-channel, between San Clemente and San Diego. One bird nearly came to my hand as I stood at the bow, but lost courage and veered off.

Icterus bullockii. Bullock Oriole. While southwest of San Clemente, headed for Tanner Bank, August 30, a juvenal female Bullock Oriole came aboard ship. It appeared to be confused as to its directions.

Other land birds that came near us while in this same general region were two sparrows, with notes not distinguishable from those of the Savannah Sparrow, and another species that, in the dull light, appeared to be a thrush comparable to the Russet-backed Thrush. There appeared good evidence of a migration route from the north possibly leaving the mainland in the region of Santa Barbara or Point Conception, passing the channel islands and striking the mainland somewhere south of the Mexican border. I was greatly surprised also to see several groups of Willets and Godwits high above the sea surface while we were in the region of Tanner Bank.

University of California at Los Angeles, October 20, 1935.

SOME NOTABLE RECORDS OF BIRDS FOR CALIFORNIA

By DONALD D. McLEAN

The following notes are some of the results of rather extensive field work and travel for the California Division of Fish and Game. The varied types of territory covered while driving some 300,000 miles or more within the State have furnished a wealth of interesting data and specimens. On long trips I have made it a point to watch roadside trees, bushes, fences and fields for things of ornithological interest. I have been well repaid with specimens and observations on many species.

Mycteria americana. Wood Ibis. On June 29, 1930, on the Salinas River, 4 miles west of Gonzales, Monterey County, I collected an adult male of this species. Two of the birds were feeding in a shallow pool.

Lophodytes cucullatus. Hooded Merganser. A female adult was obtained 5 miles northeast of Los Banos, Merced County, on December 14, 1930. It was accompanied by another one apparently in the same plumage.

Buteo lagopus s. johannis. American Rough-legged Hawk. A female adult was obtained on February 5, 1934, at Canby, Modoc County. This appears to be the first definitely recorded specimen from this county although I have seen a number of living individuals in that region.

Falco peregrinus pealei. Peale Falcon. On November 10, 1933, Mr. Nathan Moran, of San Francisco, shot an adult female while hunting ducks on Tubbs Island, Sonoma County. Mr. Moran very kindly gave the bird to me.

Falco columbarius suckleyi. Black Pigeon Hawk. An adult female was shot at Cold Flats, 16 miles southeast of Mount Hamilton, Santa Clara County, on April 11, 1933. This is a typical black female. Another individual was found dead on the bank of Guadalupe Creek, 1½ miles northwest of San Jose, Santa Clara County, on March 3, 1933. This specimen is a "mummy" now in the collection of the Museum of Vertebrate Zoology. A male adult, intergrade between this race and the Western Pigeon Hawk (*Falco columbarius bendirei*), was taken 4½ miles southwest of Gonzales, Monterey County, on February 12, 1933.

Falco columbarius richardsonii. Richardson Pigeon Hawk. A female adult was collected 3

miles north of Standish, Honey Lake Valley, Lassen County, on January 21, 1935; it was in pursuit of Horned Larks.

Pluvialis dominica dominica. American Golden Plover. A female adult was secured at Alviso, Santa Clara County, on September 21, 1933. This bird was observed for about three weeks before it was finally obtained.

Totanus flavipes. Lesser Yellow-legs. A female immature was secured at Alviso, Santa Clara County, on September 13, 1932, from a flock of about forty individuals.

Calidris canutus rufus. American Knot. A male immature was collected at Alviso, Santa Clara County, on September 13, 1932.

Pisobia melanotos. Pectoral Sandpiper. A female was taken at Alviso, Santa Clara County, on September 10, 1932. On September 11, 1933, a male was collected at the same place. In this area this species has been found to be quite common. About forty were seen at one place in 1933, and about twenty on an adjoining area at the same time.

Pisobia bairdii. Baird Sandpiper. On October 9, 1929, at an alkali pond in Deep Springs Valley, Inyo County, I secured a female adult that was in company with two Least Sandpipers (*Pisobia minutilla*).

Chordeiles acutipennis texensis. Texas Nighthawk. On August 14, 1921, an immature male was noted flying about the barns and corral at Dudley, 3000 feet, Mariposa County. It was preserved as a specimen. This location is within the Transition life zone and thus is well above the normal range of the species; but the bird probably was migrating.

Otocoris alpestris arcticola. Pallid Horned Lark. An adult female was secured 2 miles south of Reno Junction, southeastern Lassen County, on February 27, 1935. This bird was in a small flock of other horned larks. This is the first definite record of this subspecies in this State as far as I can find. I am quite sure that I have seen others in the same region.

Oreoscoptes montanus. Sage Thrasher. An adult female was secured at Dudley, Mariposa County, on April 10, 1919, and an adult male in Panoche Valley, east of Panoche Pass, Fresno County, on February 12, 1928.

Regulus satrapa olivaceus. Western Golden-crowned Kinglet. An adult male, in breeding condition, was collected 3 miles northwest of the La Honda summit of the Santa Cruz Mountains, in San Mateo County, on June 10, 1933. Several others were seen and heard near the same place.

Bombycilla garrula pallidiceps. Bohemian Waxwing. Three specimens were collected on December 16, 1926, at Dudley, Mariposa County. Thousands were present there from early December, 1926, until about March 1, 1927.

Lanius borealis invictus. Northwestern Shrike. A series of eleven specimens was collected in Lassen County. The earliest fall record is an adult female, from 6 miles southwest of Termo, on the edge of the Madeline Plains, on October 8, 1934, and the latest spring records are of an immature female, 3 miles southeast of Buntingville, on February 26, 1935, and a female adult on the same date, 2 miles southeast of Milford. Both localities are in Honey Lake Valley. It was rather interesting that only one male shrike, and that an immature, on December 15, 1934, is contained in this series.

Dendroica occidentalis. Hermit Warbler. A male adult was secured 3 miles north of the La Honda summit of the Santa Cruz Mountains, in San Mateo County, on June 10, 1933. This bird was evidently in full breeding condition and showed great anxiety when I started "squeaking." Others were seen in the same vicinity.

Agelaius phoeniceus caurinus. Northwestern Red-winged Blackbird. As I shot an albino Bi-colored Red-winged Blackbird, 3 miles north of the Gray Lodge State Game Refuge, in Butte County, on February 2, 1933, and walked over to pick it up, I was surprised to see another rather large Red-wing lying near by that had been killed by a stray shot. It was an adult male of this form.

Oberholseria chlorura. Green-tailed Towhee. On April 30, 1933, I obtained an adult male on the Silver Creek grade, 4 miles southeast of the town of Evergreen, Santa Clara County.

Calamospiza melanocorys. Lark Bunting. An adult female was collected on September 13, 1924, at Dudley, Mariposa County.

Zonotrichia leucophrys leucophrys. White-crowned Sparrow. In the center of the San Joaquin Valley, 5 miles east of the junction of the San Joaquin and Merced rivers, I shot an adult male on May 14, 1933. It was with some linnets on a roadside pile of stumps and fruit tree prunings.

Calcarius lapponicus alascensis. Alaska Longspur. About 3 miles north of Standish, Honey Lake Valley, Lassen County, I secured four specimens: on January 20, 1935, a female adult; on January 21, 1935, a male adult; on January 24, 1935, two male adults. There were a good many in a mixed flock of about 15,000 Horned Larks.

California Division of Fish and Game, San Francisco, California, September 13, 1935.

TRAPPING CEDAR WAXWINGS IN THE SAN JOAQUIN VALLEY, CALIFORNIA

WITH ONE ILLUSTRATION

By CHARLES H. FELTES

It has been my desire ever since my entry into the field of bird-banding in 1930 to band some species of bird in mass numbers, a species that would furnish numerous returns along its migratory route. With that in mind, my thoughts centered on various birds, but on account of my regular work it was impossible to devote the time required for trapping.

Gambel Sparrows furnished the bulk of my captures each year, but returns were not encouraging. Then came the spring of 1932 and, as has been noted in the past few years, the Cedar Waxwings (*Bombycilla cedrorum*) were on hand to foray through the town of Modesto, California, and surrounding country to feed on toyon, black haw, mistletoe, and numerous other berry-producing plants and bushes. Many times I observed them sitting like sentinels in the tops or among the branches of trees, an occasional "hiss" emanating from here and there among them, gradually increasing in volume until as if from a given signal there was a sudden dash to the berry bush, then a hissing, seething mass of birds.

It was while watching one of these performances that the idea occurred to me that it might be possible to trap them by using the same kind of berries they were eating. I had some toyon bushes in my yard but the birds had not as yet located them. So gathering some of the berries a "set" was made with a series of two- and four-celled Potter traps in the yard of a friend some four blocks distant. Shortly after the noon hour the birds made a dash down to the traps to secure whatever berries they could. After they retreated to the trees there were some twenty-odd birds trapped. These were gathered, the traps re-set, and the birds were then banded and released. During the afternoon a few more were taken and at the end of the day 26 Cedar and 6 Bohemian (*Bombycilla garrula*) waxwings had been banded. No more were taken this season.

For some reason the next year (1933) I drew a blank, although several special sets were made. The berry bushes in my yard went to the "cleaners" after a ten minute attack by a good-sized flock. Not even a berry was left for my pet Western Mockingbird which made my yard its rendezvous. Those voracious gluttons had done a thorough job. A decision was made after a survey of the "robbery". Next year I would be prepared, and so I was. Early in the spring of 1934, the middle of January to be more exact, a cover was made for each of the toyon bushes out of one-inch mesh wire netting. It was so effective that pet mocker was cheated out of its regular bill of fare except what it could get through the wire or for those berries that had fallen to the ground.

Then about the middle of February the Cedar Waxwings made their first attack. Their presence in the vicinity had previously been noted and my traps had been baited and set for many days. The mockingbird would dash at one and then at the flock, chase them from one tree to the other, and finally they would fly away only to reappear when they thought the mocker was not on duty. On one occasion the mocker actually flew against one of the waxwings and knocked it from the limb, the latter recovering itself when just about half way to the ground. At times it seemed so exhausted that it would be only a matter of time before they would overwhelm it; but at each return it was back at them.

This warfare continued for about a week, and seeing that I was getting nowhere with my trapping I decided to trap my mocker and take him for a ride. This was

finally accomplished after all bait was taken away from the traps except a small amount inside each one. A band was placed on it as it was released about four miles from town. It never has returned to my yard. This seemed to be exactly what was necessary to get the waxwings to the traps; for the next day, February 25, 161 birds were trapped and banded. Two days later 12 more were taken and the next morning 64 were in the traps. On account of my regular work I was unable

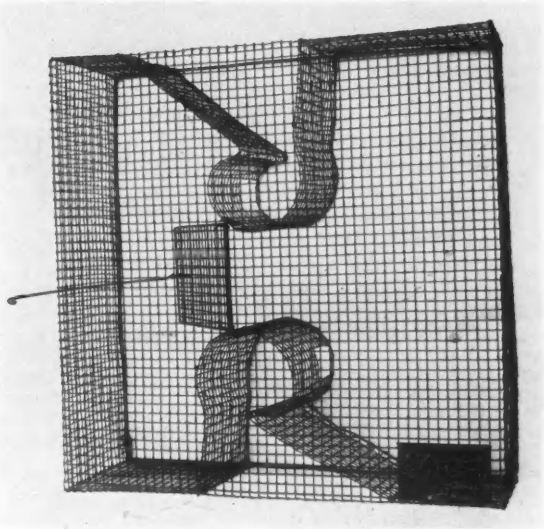

Fig. 5. Trap is hanging on side of building and you are looking at it just the same as if the camera were directly over and a little to the right of it and the trap were on the ground. This is the "Modesto" trap spoken of in this article, with the new baffle plate attached and about half way open. The wire rod protruding through the trap is used to pull the plate up flat against the top and folds down flush across the top, out of the way.

to trap further, so the season closed with a total of 237. I felt somewhat elated I must admit, for it never occurred to me that it would be possible to take so many birds of this species in such a short time. There were a few repeats (3) and no Bohemians showed up in the flock.

A new trap invented the previous year by Mr. Irl Rogers and myself was responsible for so large a catch; 31, 23, and 17 birds have been taken at a single catch in one trap. Since then as high as 39 were taken at one gathering and 20 to 25 were common captures. The trap is 24 inches square and 8 inches high, having an entrance funnel on two sides. (See fig. 5.)

With the arrival of the 1935 season, Cedar Waxwings again put in their appearance. They were first observed in the fall of 1934 on October 3, when a small flock of 12 birds was noted. On the 17th of the same month 45 birds were observed. From then on they became common; small flocks were seen in nearly every part of town during the remainder of the year. On January 2, 1935, 75 birds were observed. They seemed to become more numerous as spring approached and early in February (about the 10th) my co-worker, Mr. Rogers, reported seeing many

hundreds of them in the raisin warehouse district in the southeast part of Modesto, 90 miles southeast of San Francisco. As he was somewhat excited about it I made an early investigation and found his statement to be correct. We estimated the flock to contain 1000 to 1500 birds. We were conservative I am sure, for since then we have estimated other flocks with greater accuracy and found they contained more birds than we usually estimated.

On February 14, I asked for and received permission from the manager of a local raisin dehydrating and packing plant to do some trapping on the flat roof of one of the storage sheds. The birds were very numerous here as the sides of the shed were open and the birds would fly in under the roof and help themselves to the raisins stored in the boxes underneath. Their depredations were of a serious nature, as many of the boxes along the outside rows had been levied against by them for at least one-fourth of the original contents. After the attention of the manager was called to it, the boxes were covered with trays to keep the birds out. This arrangement worked satisfactorily.

Securing a ladder from the plant that afternoon, with which to get on and off the roof, a set was made with Modesto, Potter, and some newly designed warbler traps. They were in place and baited by 2:30. At 5 p. m., when the last bird was released, a check showed 111 had been banded. From then on, they were trapped in large quantities until toward the end of the season, banding being discontinued after May 13 when approximately only 200 birds were seen. The next day, May 14, but 14 were observed and the last ones (about 5) on May 19. The following table will show the total captures each day which include new birds, repeats, and returns. It also shows the number banded each hour (average).

Date 1935	Hours per day	Number birds trapped	Average per hour*	Number banded	Number of repeats	Per cent new bands	Per cent repeats	Returns
Feb. 14	2½	111	44	111	0	100.0	0.0	0
Feb. 15	6	342	51	330	11	96.4	3.6	1
Feb. 17	8	355	44	330	24	92.9	7.1	1
Feb. 19	8	412	52	343	69	83.4	16.6	0
Feb. 24	8	403	50	325	77	80.6	19.4	1
Mar. 4	8	200	25	169	31	84.5	15.5	0
Mar. 5	8½	262	31	173	89	66.0	34.0	0
Mar. 6	7	156	22	114	42	73.0	27.0	0
Mar. 8	8	270	34	190	80	70.3	29.7	0
Mar. 9	½	14	28	4	10	28.5	71.5	0
Mar. 10	8	462	58	284	178	61.4	38.6	0
Mar. 16	8	322	40	236	86	73.2	26.8	0
Mar. 17	5	83	17	56	27	67.4	32.6	0
Mar. 19	1	11	11	3	8	27.0	73.0	0
Mar. 23	1½	100	67	68	32	68.0	32.0	0
Mar. 24	4	214	54	122	91	57.0	43.0	1
Mar. 26	4½	239	53	147	92	61.5	38.5	0
Mar. 27	8	156	20	86	70	55.1	44.9	0
Mar. 30	1½	61	41	34	27	56.4	43.6	0
Mar. 31	8	239	30	88	151	36.8	63.2	0
Apr. 2	10	333	33	132	200	39.7	60.3	1
Apr. 8	8	295	37	164	130	55.7	44.3	1
Apr. 13	5	217	43	129	88	59.4	40.6	0
Apr. 14	6½	343	53	98	244	28.6	71.4	1
May 6	2	48	24	36	12	75.0	25.0	0
May 9	4	206	52	157	49	71.3	28.7	0
May 10	7	50	7	30	20	60.0	40.0	0
May 12	4	51	13	35	16	68.6	31.4	0
May 13	1½	27	18	16	11	59.5	40.5	0
Totals	162¾	5982	36	4010	1965	.....	.....	7

*Birds per hour figured to the nearest whole number.

Thirty-two days and parts of days were spent in trapping, on three of which no captures were made, leaving twenty-nine days of actual banding operations, consuming 162¾ hours; 4010 new birds were taken, an average of 206 per day; 1965 repeated, nearly 50 per cent. The greatest number banded in a single day was 343, the smallest, 3; the greatest number trapped (new and repeats), 462. Seven returns were taken, five of them being birds I banded in the spring of 1934.

The other two were "foreign" or "private" bands, the identity of which I have been unable to ascertain. One bore the number "35" and the other "27". These bands were of identical make, the numerals being italicized on a very hard thin metal that had the feel and appearance of nickel silver. There was no inscription or other mark inside or out by which an identification could be traced. In an attempt to trace them, five northern newspapers in California, Oregon, and Washington were contacted to carry a news article about the bands, but no results were obtained. In answer to an inquiry, word was received from H. F. Witherby of London, England, in charge of banding in that country, "that the bands were not from there." He also stated, "that his and all of the recognized marking institutions of Europe have definite name and address for the return of recoveries." It seems reasonable to assume, then, that these are "private" bands placed on birds, either held in captivity from which they escaped or were freed, with the expectation that they might again be checked back in the locality in which they were banded. Whatever the case, it is hoped that some reader of this article may furnish the information necessary to make the identification and forward it to me.

Raisins were used for bait, the dehydrated (artifically dried and bleached) being much preferred by the birds to those dried in the sun. The amount used was approximately 300 pounds. These attracted several other birds to the traps, which included the Western Mockingbird (*Mimus polyglottos leucopterus*), Western Bluebird (*Sialia mexicana occidentalis*), Audubon Warbler (*Dendroica auduboni*), California Linnet (*Carpodacus mexicanus frontalis*), and Gambel Sparrow (*Zonotrichia leucophrys gambelii*).

No casualties were suffered in any of the traps. A few waxwings were slightly hurt in handling, possibly two or three to the extent that they succumbed. A great many were taken, though, that showed they had had a hectic career, the most outstanding being one with the front half of the upper mandible and all toes on the left foot except the hind one shot away. The right leg had also been broken. Another had suffered a somewhat similar fate by losing half of the upper and one-fourth of the lower mandible. Other accidents showed lost, broken, and twisted legs, lost toes and broken wings, an eye out, and other minor injuries.

A partial albino Cedar Waxwing was taken on May 9. The brown of the head was a much softer shade than on the average bird. The first, second, and third primaries and secondaries of the right wing were pure white, the fourth primary about half white. Left wing normal. The middle toenail of the right foot and the right, middle, and hind toenails of the left foot were flesh color, all others being black. The rest of the bird was normal.

An experiment that developed into a custom was to leave two or three birds in each Modesto trap to act as decoys. This proved highly successful from the start and the entire flock was readily attracted in this manner. Immediately, when part of a flock decoyed in, practically all other waxwings within sight of them in the vicinity followed. Flocks of from 2500 to 3000 have decoyed in this manner, not once, but time after time.

Weather conditions best suited to trapping seemed to be on dull and cloudy days

or immediately following a storm. On clear warm days the birds became wary, broke up into small flocks and roamed over a greater area of the town and adjacent country, but usually re-assembled in one big flock in the raisin district in mid-afternoon. The birds were very unafraid and hungry during the early spring and on several occasions alighted on the storage cage within a foot of my hand to grab a raisin or two that was lying there; then as the weather got warmer they became more shy. On very cold or wet days it was common to see the flock crowded and huddled in all of the available space between and around the big electric transformers on the power poles and in the sub-station near by, taking advantage of the warmth created by the electricity. Several pictures were taken of them in these locations.

On one occasion a banded bird was gently laid on its back about two feet distant and remained in that position approximately 15 minutes while the banding continued and released birds flew off directly over it. Natural conversation was carried on during this period before the bird took flight. A later experiment was carried out by placing another bird in a like position where it remained for a little over half an hour. Ordinary conversation was carried on by four persons, traps and storage cages were passed back and forth over the bird, other birds flew over it, I got up and walked around it carrying storage cages that were bumping together—and yet it did not fly. Gathering the cages to make another collection of birds from the traps, I had gotten about 75 feet away when a switch engine came rumbling down the track about 60 feet from the bird, and this scared it into sudden flight.

Returns on the Cedar Waxwings banded to date are interesting and form a skeleton of their migratory route that may be filled in during the cycle of this coming season's migration. Redlands (San Bernardino County), California, is the southernmost point of recovery to date, and Olympia, Washington, the northernmost. Returns to date are listed as follows:

Band no.	Date banded	Recovered at	Recovery date	Nature of return
F-131863	2-25-34	Modesto, Calif.	4- 8-35	Trapped, released
F-131865	2-25-34	Mendota, Calif.	3- 1-35	Shot in raisin yard
F-131898	2-25-34	Modesto, Calif.	3-24-35	Trapped, released
34-111228	2-25-34	Modesto, Calif.	3- 6-34	Found dead
34-111261	2-25-34	Modesto, Calif.	2-24-35	Trapped, released
34-111284	2-25-34	Modesto, Calif.	2-17-35	Trapped, released
34-111293	2-25-34	Olympia, Wash.	7-11-34	Found dead
34-111314	2-25-34	Ceres, Calif.	4- 3-34	Choked to death
34-111328	2-27-34	Modesto, Calif.	2-15-35	Trapped, released
34-111334	2-27-34	Roseburg, Ore.	5-29-34	Killed
34-111393	2-28-34	Redlands, Calif.	1-13-35	Found injured, died
34-170315	2-14-35	3 miles SE Modesto	3-31-35	Found dead
34-170480	2-15-35	Modesto, Calif.	5- 2-35	Found dead
34-170509	2-15-35	Modesto, Calif.	3-21-35	Found dead
34-170586	2-15-35	Modesto, Calif.	3-21-35	Found dead
34-170614	2-15-35	Modesto, Calif.	2-16-35	Killed by auto
34-170663	2-15-35	Gilroy, Calif.	5-20-35	Shot in cherry orchard
34-179007	2-17-35	Auburn, Calif.	5- 6-35	Shot in cherry orchard
34-179198	2-17-35	Fresno, Calif.	2-23-35	Shot in raisin yard
34-179219	2-17-35	Fresno, Calif.	2-23-35	Shot in raisin yard
34-179659	2-19-35	Sacramento, Calif.	4- 7-35	Found dead
34-179870	2-24-35	Modesto, Calif.	3- 1-35	Found dead
34-179942	2-24-35	Near Modesto, Calif.	3-10-35	Shot
34-179944	2-24-35	Modesto, Calif.	3-20-35	Electrocuted
35-105071	3-16-35	Yankee Hill, Calif.	6- 3-35	Shot in mulberry tree
35-105315	3-24-35	Modesto, Calif.	5-20-35	Found dead
35-105481	3-26-35	Modesto, Calif.	5-11-35	Found dead
35-105979	4- 8-35	Stockton, Calif.	5- 1-35	Found dead
35-108123	4-13-35	Dinuba, Calif.	4-21-35	Shot by boy

Added to this list are 191 birds that were shot by one individual over a period of ten days in his cherry orchard one-half mile from the banding station. These are total returns on all Cedar Waxwings banded (4274) in 1932, 1934, and up to and including May 13, 1935, a recovery percentage of 5.17.

Reports received by me last spring from various parts of the state indicate that

the migration was general. Persons in the Los Angeles and Fresno districts reported great numbers, and Walter Powell, acting ranger-naturalist of Sequoia Park, stated the birds were observed near "Sunset Rock" (6400 feet) within the Park. B. L. Fredrickson, game warden at Gilroy, reported a flock of five to six hundred in a cherry orchard at that place and C. I. Holmes, of Auburn, stated that flocks of forty and fifty were observed in cherry orchards in that district.

It is to be regretted that complete records were not kept on arrival and departure during the past five years, the only complete one being that of 1934-35, when the last one was seen on May 19. The records show time of appearance in the fall and are as follows:

Year	First seen
1931	October 10
1932	October 30
1933	October 2
1934	October 12

On April 13 two indications of breeding were noted in a large flock that occupied the electric wires along side the trapping station. This consisted of two birds edging to and from each other along the wire for a period of two or three minutes. Then when finally they came close together the female allowed the male to contact it and perform the mating act which lasted but a few seconds. Just a month from this date my last bird was banded and but 200 were seen in the vicinity. One week later there was none.

Modesto, California, August 18, 1935.

THE FAMILY RELATIONS OF THE PLAIN TITMOUSE

By JOHN B. PRICE

The family relations of birds furnish some of the most interesting problems of ornithology. Many questions arise in this connection and among them are the following:

1. Do birds nest in the same territory year after year?
2. Do birds keep the same mates from year to year?
3. Is there any difference between the sexes in their habits of retention of a nesting territory?
4. Do young birds stay in the same locality where hatched and nest there the following year?

This problem has been investigated for the House Wren (*Troglodytes aëdon*), a migratory bird, by S. Prentiss Baldwin (Auk, 38, 1921, p. 237) who finds that this wren does not keep the same mate but that "divorce" is the rule. The Plain Titmouse (*Baeolophus inornatus*) is similar to the house wren in readily nesting in bird houses or nesting boxes but differs from that bird in one important matter. The House Wren is migratory while at Stanford University, California, the Plain Titmouse is resident the entire year, usually raises only one brood a season, and is usually seen in pairs.

The writer started this study in 1928. At that time colored celluloid bands were not in use, so he used only the government aluminum bands. This of course made the securing of results more difficult as it necessitated the capturing of the birds each year for identification and this was not always possible. The birds were captured in the nest-boxes, each box having a removable top and a shutter that closed the entrance when a person at a distance pulled an attached string.

The capture of the first member of a pair feeding young was usually not difficult; but the resulting disturbance usually greatly alarmed the mate and made its capture much harder. Sometimes the birds deserted the nest after one had been banded. When they did not, it often took several hours or days to capture the second adult, and sometimes, in spite of great effort, it was not captured at all, thus leaving the records incomplete.

In the 1928 season only 12 nest-boxes were in place and 7 were occupied by birds. A short account of this was published (Wren-Tit, **1**, no. 3, 1929). In 1929, 39 boxes were in place and by 1931, the total number was 60. The writer was absent from Stanford in 1930 and was able to spend only one day in the field there that season. The only birds then captured were incubating females.

Nearly all the boxes were placed in oak trees, where the birds secure most of their food both in summer and winter. They were distributed according to the density of the oaks in an area on the Stanford Campus approximately one and a quarter miles long by three-quarters of a mile wide. The titmouses were not the only animals to use these boxes. The Western Bluebird, Chestnut-backed Chickadee, and Slender-billed Nuthatch also nested in them as did also mice and bumblebees.

The work was sometimes interrupted by irresponsible persons who removed the boxes or so damaged them that they could not be used for nesting. The writer replaced these boxes, but the interruption often prevented any birds from using them that season and caused more gaps in the records. The California Jay (*Aphelocoma californica*) is an important enemy of the titmouse. Jays are often seen about nesting boxes containing young titmouses and sometimes perch on the box and peer inside. When the young birds leave the nest the jays often dive at them and kill them.

The sexes of the Plain Titmouse are similar in appearance and cannot be distinguished in the field. However, one member of the pair during the breeding season has a bare area on the breast called a "brood patch." Autopsy shows this member to be the female. The male does not have this brood patch and thus the sexes can be distinguished in the hand. Only females ever were captured incubating the eggs.

This study was carried on from 1928 to 1933 with a partial interruption in 1930. In addition, one age record was determined in 1934.

Number of Eggs.—For fear of causing desertion of the nests the birds were disturbed as little as possible and so not as many observations on the general nesting habits were made as would be desirable. However, some data were secured concerning the number of eggs laid. The published statements conflict on this matter. Dawson (Birds of California, 1923, p. 602) gives the number as 5 to 7; Keeler (Bird Notes Afield, 1899, p. 111) gives it as 6 to 9; Bailey (Handbook of Birds of the Western United States, 1902, p. 456), Wheelock (Birds of California, 1910, p. 348) and Hoffmann (Birds of the Pacific States, 1927, p. 229), each gives the number as 6 to 8.

At Stanford the writer took notes on 62 titmouse nests in which egg laying was known to be complete (by later hatching of the eggs) and found that the average number was 6.75 and that the number ranged from 3 to 9, with the following distribution:

3 eggs in 3 nests	7 eggs in 17 nests
4 eggs in 1 nest	8 eggs in 14 nests
5 eggs in 8 nests	9 eggs in 7 nests
6 eggs in 12 nests	

The Age of Titmouses.—The oldest titmouse recorded was a male B42172 which was banded as an adult in 1928 and was recaptured nesting in the same box in 1934 when it must have been at least seven years old. It was absent in 1935. Three birds (2 males, 1 female) were found to be at least five years old; and 8 birds (2 males, 6 females) were at least four years old.

Numbers of Adults and Juveniles Recaptured.—As is shown below, there were a great many more recaptures of birds banded as adults than of juveniles in the following seasons.

Year	Adults captured*	Adults recaptured in later years	Per cent	Juveniles banded	Juveniles recaptured next year
1928	10	3	30	18	1
1929	14	8	57	32	0
1930	5	5	100	0	----
1931	28	15	53	47	0
1932	40	20	50	48	1

*Including returns during that year as some birds were captured for more than two years.

Does a Titmouse Nest in the Same Locality Year After Year?—For the moment let us disregard the question of whether the titmouses keep the same mates and treat the birds as individuals in order to include those cases where only one member of a pair was captured. The following results for *adults* show the number of *cases* in each group. For instance a bird nesting in the same box for three years would be two cases of renesting.

Adults renesting in same box	Adults nesting 43 yards to 90 yards away	Adults nesting 200 yards away from 1st box	Adults nesting more than 200 yards away
33	17	1	0

Those cases above where the adults changed their nesting box for one less than 100 yards distant probably do not represent a change in nesting territory but rather only a new nesting place in the same territory occupied the year before. In the limited time at his disposal the writer was not able to map the boundaries of the territory of each pair, but boundaries probably nearly always included both nest-boxes; for the oaks where these birds forage are widely spaced. If the changing of nest-boxes were really a change of nesting territory one would expect that the former territory would be taken over by another pair of titmouses nesting in the first box. With the exception of the female that moved 200 yards, this never took place. The first box was always either empty or used by bluebirds or chickadees. Often a bird would alternate between two boxes from year to year.

Thirty-five titmouses banded as adults were never recaptured. Some of them doubtless came to grief. The question arises: Did the rest change their nesting territory or did each stay in its former territory but nest in some natural site where it escaped observation the following year? The latter supposition is at least possible, for the following reason. If a pair had vacated their territory one would expect that ordinarily other titmouses would take it over and use the nesting-box. But with one exception this did not happen, and in each case where the original birds were not recaptured the following year the nesting-box was either empty or out of commission.

Returns of Juvenile Titmouses.—In all, 145 juveniles were banded; of these only two were ever recaptured. One female B42178 was banded as a juvenile in 1928 and was recaptured in 1929 nesting in a box over a half mile (1200 yards) away. Unfortunately, later during the season it was found dead. The second, also a female,

F80550, banded as a juvenile in 1932, was recaptured in 1933 nesting in a box 700 yards distant. The mate of this one-year-old female was then at least five years old.

The following summary of the above results deals with individual birds, not cases. A bird nesting in the same box three years is counted only once.

	Number banded	Number renesting in same locality	Number nesting over ¼ mile away	Per cent recaptured
Adults	64	29	0	45.3
Juveniles	145	0	2	1.3

From these results it seems fair to say that an adult titmouse usually nests in the same territory year after year and that a juvenile does not nest in the same territory where hatched.

Does a Titmouse Keep the Same Mate from Year to Year?—During the period from 1928 to 1932 twenty-six pairs of titmouses were banded. Of these, 12 pairs were never recaptured although as is stated above it is possible that some of them were still in the same territories nesting in natural sites. The family relations of the 14 remaining pairs are shown in the table below. The birds were banded with numbered Biological Survey bands, but in order to save space in the table each individual bird is represented by a letter or combination of letters. For instance bird B42172 is recorded as B♂. An "x" shows a mating; "C♀ x ?" means that the mate of C was not captured that year.

PERMANENCE OF MATING IN PLAIN TITMOUSE

(Letters indicate individual birds)

Year					
1928	A♀ x B♂	D♀ x E♂			
1929		D♀ x E♂	H♂ x I♀		
1930	? x C♀	? x F♀			
1931	? x C♀	E♂ x F♀	I♀ x J♂		
1932	B♂ x C♀	E♂ x F♀	I♀ x ?		
1933	*B♂ x C♀	F♀ x G♂			
1929	K♀ x L♂			S♀ x ?	
1930	K♀ x ?	O♀ x ?			
1931	K♀ x L♂		Q♀ x R♂	S♀ x T♂	
1932	L♂ x M♀ (N juv.)	O♀ x P♂	Q♀ x R♂	S♀ x T♂	
1933	L♂ x——N♀	O♀ x P♂	Q♀ x R♂	T♂ x U♀	
1929		AA♀ x BB♂			
1930					
1931	V♂ x W♀	AA♀ x BB♂			
1932	V♂ x W♀ X♂ x Y♀		BB♂ x CC♀	DD♂ x EE♀	
1933	V♂ x W♀	**Y♀ x Z♂	? x CC♀	DD♂ x EE♀	
1929		HH♀ x II♂			
1930					
1931		HH♀ x II♂	JJ♀ x KK♂		
1932	FF♀ x GG♂ ? x HH♀	II♂ x JJ♀			
1933	FF♀ x GG♂ ? x HH♀	JJ♀——x——LL♂			

*Also recaptured in 1934 (mate not captured).
**In a nest-box 200 yards distant from the 1932 nest.
All the other above birds nested either in the same box year after year or in one less than 100 yards distant.

The above table shows that 11 of the 14 pairs were mated together for at least two years although some of them later took new mates. In only three pairs the birds

did not remate at least once. To summarize:

Same pair mated for 3 years	2	
Same pair mated for 2 years	3	
Same pair mated for 2 years and then another mate for 2 years and then another mate	1	
Same pair mated 2 years, then new mate 1 year	4	
Same pair mated 2 years, then a new mate 1 year and then another new mate	2	
		11
Different mate 2 years	2	
Different mate each of 3 years	1	
		3
Number of "divorces"		1

An interesting fact is that there was only one case of "divorce" where a bird took a new mate while its former mate was still known to be living. In all other cases where a titmouse took a new mate the former mate was never recaptured anywhere and quite probably was dead, especially as in several cases it was known to be several years old.

So far as the results go, then, they indicate that the Plain Titmouse stays in the same nesting territory from year to year and keeps the same mate.

Is There a Sex Difference in Retention of Territory?—In some species of birds the male establishes a territory and then by singing attracts a female. If the male is killed the female leaves for another male's territory. But in the titmouse in the only case of known "divorce" each female kept its old nest-box and the male moved 80 yards to the new mate (birds HH♀ II♂ JJ♀). In 1932 no male was captured at the box with the deserted female HH and it is possible that this was a case of polygamy instead of divorce.

With this one exception there seems to be no sex difference in territory retention in the titmouse. If one member of a pair, either male or female, disappears, the surviving bird regardless of its sex stays in the nesting territory and by the next season has acquired a new mate. For instance D♀ and E♂ were mated together for two years. Then D♀ disappeared and E♂ remained in the territory and took a new mate F♀ for at least two years. Then E♂, then at least six years old, disappeared and F♀ kept the territory and took a new mate G♂. Other cases are similar.

If as seems to be the case an adult titmouse spends its life in one small nesting locality the chance of a "widowed" bird getting a new mate would theoretically be small, as all other "widowed" adults would presumably be waiting in their own territories for mates to come to them. In a few cases, such as Y♀, birds may move to a new territory, but as the juveniles do not nest in the locality where hatched it seems logical to believe that those that survive their first winter spread out over the country until each finds a "widowed" bird of the opposite sex. This actually happened in one case where L♂ nested in the same territory for four years and the fifth year mated with N♀ which had been hatched the year before in a box a quarter of a mile away.

There are many unsolved problems about the Plain Titmouse. In addition to details of nest building and the care of the young it would be interesting to learn the action of the mates toward each other during the winter months; how long the young birds stay with their parents; why they eventually leave; and their actions in finding mates.

Summary.—A study of the family relations of the Plain Titmouse (*Baeolophus inornatus*), a non-migratory bird, was made at Stanford University, California, from 1928 to 1933. The birds were captured and banded in nest-boxes. The number of eggs laid ranged from 3 to 9 with an average of 6.75. One titmouse was found to be at least seven years old.

Forty-five per cent of all titmouses banded as adults were recaptured in following years and all except one were nesting either in the same nest-box or in one less than 100 yards distant. Of those juvenile birds banded in the nest only two, 1.3 per cent, were recaptured nesting the following year, and both were more than a quarter of a mile distant from the box where hatched.

A titmouse usually keeps the same mate from year to year and there was only one known case of "divorce." Of a total of 14 pairs recaptured, 11 were mated together for at least two years and only 3 were not. No sex difference was found in the retention of territory from year to year. If a bird lost its mate the survivor, whether male or female, remained in the nesting territory and secured a new mate. In one case the new mate was known to be a juvenile of the year before.

Stanford University, California, July 26, 1935.

AN OBJECTIVE METHOD FOR MEASURING IRRITABILITY IN BIRDS

By SHERBURNE F. COOK and HELEN C. FREDRICKSON

The purpose of the experiments herein described was to work out an objective method for measuring the irritability of a bird. In this sense we take irritability to signify the degree of responsiveness of the bird to the sum of environmental stimuli, whether or not all the stimuli are recognized as such by the observer. Thus one bird may give the impression of extreme activity, another may be relatively quiet. If we conceive of the observed actions as representing motor responses to external stimulation, then under field conditions we have no quantitative reproducible method for determining whether the differences lie in variation of the external stimuli, internal stimuli, or the nervous system of the bird. Some of these variables may be ruled out, partly at least, if we study an individual under controlled conditions.

Method.—In these experiments a canary was used which had been kept in a cage in the laboratory for some weeks. The particular factor studied was light intensity and the reactions of the bird were recorded by the kymographic method.

The bird cage was placed in a photographic dark room for half an hour prior to a run with the light at a reduced but constant intensity. A kymograph was set up to revolve at a slow speed, at a considerable distance from the bird. A signal magnet with writing point was arranged for recording and wires run to a switch key near the observer. The latter was seated close to the bird, and made a contact with the key whenever the bird made any motion, thus getting a record of all motions. A time clock recorded 5-second intervals on the drum. Each run consisted of 30 to 60 minutes of continuous observation. After each experiment the bird was brought for at least 30 minutes into a normal light intensity to feed and drink. Then it was replaced in the room at the light intensity to be used in the following experiment. In all-day testing the period from the beginning of one experiment to that of the next was 3 hours.

The light intensity was determined in a purely arbitrary fashion. A 10-watt bulb was placed in front of a camera at a constant distance and side leakage prevented. The light passed through a ground glass plate at the back of the camera and illuminated the bird and its surroundings. By closing or opening the diaphragm the intensity could be varied—reproducibly—because the bird was always placed

at a constant distance from the camera (3.85 meters). The lowest intensity used was that which just rendered the bird visible to the observer.

Results.—The reactions of the canary, as observed by us, showed a typical, recurring form. Beginning with a period of complete quiescence the bird suddenly made a series of several quick, jerky motions in rapid succession, and then became motionless. At a variable time thereafter it began a new group of motions, and so on. An analysis of these motions (individually and in groups) was made with respect to (1) light intensity, and (2) time of day. Undoubtedly the influence of a host of other factors could be determined in the same way, but we restricted ourselves to these two.

The data may be analyzed in various ways. We have used the following criteria:

1. The number of groups of motions per minute.
2. The average time between groups.
3. The mean number of motions per group.
4. The average time between motions within a group.

The data are presented in the following tables. The latter are arranged with respect to the two light intensities used (as indicated by the stop number of the camera) and the time of day. In each case the average figure for several different determinations is given.

TABLE I

Number of Groups per Minute

Time of day	f.22	f.8
9 a. m.	0.55	0.80
12 m.	0.95	1.80
3 p. m.	1.22	2.67
6 p. m.	0.95	1.08
9 p. m.	0.27	.062

TABLE II

Average Time between Groups in Seconds

Time of day	f.22	f.8
9 a. m.	48	62
12 m.	40	27
3 p. m.	39	20
6 p. m.	55	34
9 p. m.	106	66

TABLE III

Mean Number of Motions per Group

Time of day	f.22	f.8
9 a. m.	0.82	0.93
12 m.	1.20	1.04
3 p. m.	1.09	1.11
6 p. m.	0.90	1.08
9 p. m.	1.05	0.92

TABLE IV

Average Time in Seconds between Motions within a Group

Time of day	f.22	f.8
9 a. m.	0.82	0.93
12 m.	1.20	1.04
3 p. m.	1.09	1.11
6 p. m.	0.90	1.08
9 p. m.	1.05	0.92

From the tables the following conclusions may be drawn:

1. With respect to the effect of light intensity there is no doubt that the frequency of occurrence of motion groups is greater at the higher light intensity (that is, f. 8). However, the mean number of motions per group seems to be rather constant and there is no consistent and material difference in the average time between individual motions within the group. This might be taken to mean that once a train of motions is started, its duration is conditioned by some other factor, internal or external, than the light intensity.

2. There is a clear diurnal rhythm of irritability which reaches its maximum in the early or mid afternoon. The minimum (if the experiment had been possible) would probably have been found to be during the early morning hours. The rhythm is most clearly indicated in the frequency of group occurrence, although it is also suggested in the frequency of the individual motions within each group.

3. It is suggested that a method of observation and analysis such as is here described might be utilized in order to secure comparative quantitative data concerning the activity of many birds under both laboratory and field conditions.

Department of Physiology, University of California, October 1, 1935.

SAVANNAH SPARROW MIGRATION ROUTES IN THE NORTHWEST

WITH MAP

By H. S. SWARTH

In "Birds of Nunivak Island, Alaska" (Pac. Coast Avifauna no. 22, 1934, pp. 48-51, fig.) there are detailed my convictions regarding the classification of the Savannah Sparrows (*Passerculus sandwichensis*) of the northwest. I refer particularly to the division there made between the gray-colored, slender-billed bird of interior British Columbia and Alaska, to which I apply the name *P. s. alaudinus*, and the brown-colored, larger billed bird of the Sitkan coast, to which I apply the name *P. s. anthinus*. In the Atlin region and in the upper Yukon drainage *alaudinus* characters seem to be developed to their utmost degree. My convictions remain as stated in the above cited publication, but I have come into possession of supplementary information since that was written.

In 1934, I was able to reach Atlin, British Columbia, as early as March 28, while winter conditions still obtained and before the first north-bound migrant of any kind appeared. Mr. R. M. Stewart, game warden and ornithologist, assured me that he had been getting there two kinds of Savannah Sparrows, the first arrivals in the spring being larger and otherwise distinguishable from the nesting birds, and he showed me specimens that appeared to bear out his claims. Together we watched for arriving migrants, and on April 19 secured the first Savannah Sparrow, when the ground was still mostly snow covered. We got only one or two of the larger birds then, but this year (1935, a year of delayed migration) Stewart sent me seven more, taken from May 8 to 17 (nos. 42214-42220, Calif. Acad. Sci.). The birds that I collected, as well as this later series, are sufficiently bulky and large-billed as compared with the local breeding race, to make me suspect in the field that they were the large *sandwichensis*. Comparison of specimens at once showed that this was not the case, and it was then a question to ascertain where their affinities did lie. They were not *anthinus* of the coast of southeastern Alaska, which has a more stubby bill and much more of a yellow suffusion about the head.

In the Museum of Vertebrate Zoology there is a series of breeding Savannah Sparrows from Prince William Sound, Alaska, that was discussed by Grinnell in his report on "Birds of the 1908 Alexander Alaska Expedition (Univ. Calif. Publ. Zool., 5, 1910, pp. 399-401). Although he affixed the subspecific name *alaudinus* to the series, he commented upon certain strong resemblances toward *savanna* (=*anthinus*) of the Sitkan district. My own specimens are sufficiently like these Prince William Sound birds, both in color, making due allowance for different stages of wear, and in size and shape of bill, to convince me that there is where they belong. I seem actually to have been able to detect a minor stream of transients passing through the Atlin region, just before, and partly at the same time when, the closely related breeding birds were arriving and settling down for the summer, and to learn where those migrants were bound. The migration route from Atlin toward Prince William Sound lies almost due west, very slightly to the north. The migration route southeast from Atlin, as well as the winter home of this variant, remain for some future observer to ascertain. (See fig. 6.)

Besides the satisfaction derived from finding the answer to a puzzling question, it seems to me that there are implications inherent in this Savannah Sparrow inquiry that are of some value to consider. The Savannah Sparrows, a variable group, in

Fig. 6. Apparent lines of migration of Savannah Sparrows in the northwest. A, *Passerculus sandwichensis sandwichensis,* breeds on Unalaska; travels almost east and west across the Gulf of Alaska and adjacent Pacific, avoiding the mainland coast of southern Alaska, and winters mainly on the coast between Puget Sound and San Francisco Bay. B, *P. s. anthinus,* of Kodiak Island and the Sitkan district; travels north and south along the coast, winters mainly on the coast between Puget Sound and San Francisco Bay. C, *P. s. alaudinus,* breeds in interior British Columbia, Yukon, and Alaska, reaching the coast from the Alaska Peninsula northward; migrates north and south entirely east of the Coast Ranges, the migrants being split into two streams by the Rocky Mountains, D, the Prince William Sound variant of *alaudinus*; travels east and west between Prince William Sound and northern British Columbia, probably along the east base of the Rocky Mountains to and from the winter habitat.

their modes of variation offer some difficulties in classification. Many names have been applied to local races, especially in western North America, resulting in a multiplicity of nominal subspecies, and, on the other hand, it has lately been urged that all of the many forms of the genus *Passerculus* except *P. princeps* be regarded as subspecies of one species. To place the several northern races, with their extensive

and partly overlapping migration routes, the aggregation of resident forms along the coast of California, and the Lower California birds of *rostratus* affinities and peculiar reverse migrations, all as units in a linear row of subspecies, may be observing the rules of the game that classification tends to become, but it does not help much toward an understanding of the development and relationships of the birds themselves.

Only occasionally is one fortunately enough placed to seize upon a bit of information such as I am here recording, but it is the sort of knowledge that should be sought and applied. Any general classification of the Savannah Sparrows, to be at all satisfactory, must have some basis of field work. In this particular case, anyone working from specimens alone, with no personal knowledge of conditions, might easily conclude that Savannah Sparrows from coast and interior were all alike. With birds that are as difficult of classification as these it is likely that every extensive collection contains specimens just as apt to yield misinformation with uncritical acceptance of surface appearances.

In a report upon a collection of Alaskan birds (Univ. Calif. Publ. Zool., 7, 1911, p. 84) I stated my belief that *Passerculus s. sandwichensis* might migrate across the Gulf of Alaska rather than follow the coast line. There is an old record that I had not seen at that time nor until much later, that bears directly upon this point. W. H. Dall, in a paper entitled "Notes on the avi-fauna of the Aleutian Islands, from Unalashka eastward" (Proc. Calif. Acad. Sci., 5, pt. 1, 1873, p. 27) under *Passerculus sandwichensis,* remarks: "When about five hundred and fifty miles from land (the Shumagins being nearest) in latitude 47° N., and longitude 152° 03′ W., one of these birds flew aboard, and being secured, lived several days in an extemporized cage. This was on the 13th of September, 1871."

California Academy of Sciences, San Francisco, October 10, 1935.

FURTHER STUDIES UPON THE BIRDS OF THE PLEISTOCENE OF RANCHO LA BREA

By HILDEGARDE HOWARD

During the last two years I have spent some time going over a small collection of birds excavated from the Rancho La Brea Pleistocene under the auspices of the Southern California Academy of Sciences. This material collected by the Academy many years ago, was given to the Los Angeles Museum in 1911, two years before the Museum began its own extensive excavations at Rancho La Brea. While the Museum collections have long since been cleaned and catalogued, the greater part of the Academy bird material has only recently been put in condition to study. For the cleaning and preliminary sorting of this material I am indebted to Mr. Irving Brown, who generously gave his time to this work.

In the course of studying the bones in this Academy collection, I have had occasion to make comparisons with specimens in the main Museum collection as well. The result is that I now find myself in possession of a few new facts concerning the birds of these deposits. Though I have found some scantily represented species in the Academy material which do not appear to be present in the other collections from Rancho La Brea, there is no marked difference in the variety of species. However, there is considerable difference in their relative abundance, which makes this assemblage worthy of mention.

The following major differences may be noted when comparison is made with

the census of Rancho La Brea birds as previously presented by this writer (Howard, Condor, **22**, 1930, pp. 81-88).

	So. Calif. Acad. excavation	Previous census
Anseriformes	22.1 per cent	2.5 per cent
Charadriiformes	6.6	1.3
Ciconiiformes	4.0	0.9
Falconiformes	40.3	60.3

These comparisons may not be entirely accurate because of the unnaturally scant representation in this pit of passerine bones. Only 2 per cent of the total number of individuals are of passerines as against 8 per cent in the census of the Museum localities. Undoubtedly many bones of these small forms were overlooked in collecting. Even allowing for a greater total number of individuals, however, the difference in relative abundance in the orders noted is marked.

A comparison has been made of the waterbird content of the individual Museum pits with that of the Academy excavation. This comparison shows that pit 16, from which one of the largest collections of bird bones was obtained, surpasses the Academy pit in actual number of individual waterbirds (Academy excavation, total 99; pit 16, total 126). However, relative to the total number of birds, the percentage is far less in the Museum pit. Although I have not made a complete count of the number of bird bones in pit 16, the combined totals for only two species (*Parapavo californicus* and *Coragyps occidentalis*) are slightly greater than the total number of bones of all species in the Academy pit. Pit 4, another locality in which bird remains were unusually abundant, contained less than half as many aquatic birds as were taken from the Academy locality (total of 41 individuals in pit 4). Pits 3, 13 and 36 contained, respectively, 21, 20 and 18 individual waterbirds; the ten other Museum pits in which aquatic birds were represented, included from one to nine individuals only.

The orders represented in this comparison included the Colymbiformes, Ciconiiformes, Anseriformes, Gruiformes and Charadriiformes. The grebes are known with certainty from pit 16 only; none was found in the Academy material. The ciconiiforms were better represented, with 12 individuals and 7 species in the Academy locality, surpassing even pit 16. Of the anseriforms of the Academy pit, the ducks were most abundant both in number of individuals and number of species (six or more species and 31 individuals) and included two diving ducks of the subfamily Nyrocinae. The number of individuals was equalled in pit 16, but the two nyrocine forms appear to be absent. The geese in the Academy pit total 29 individuals, exceeding by 7 the number in pit 16 or pit 4. The number of species is doubtful. Except for a questionable occurrence in pit 81, the Academy locality is unique in including one swan.

The gruiforms of the Academy pit include *Grus canadensis* only, with four individuals. This number is exceeded in three Museum pits, each of which contained two species and five or six individuals. The shorebirds are scantily represented in all pits with the exception of the Academy and pit 16. In the former there were 22 individuals representing 9 species, in the latter 55 individuals of 10 or more species. It is because of this large representation of charadriiforms that pit 16 surpasses the Academy excavation in number of waterbirds.

The Academy pit was located on the north bank of what is now the "lake" near Wilshire Boulevard. This area was so rich in asphalt that it was extensively excavated for commercial purposes before the importance of the contained bones was recognized. Later, scientific work was lucrative along the borders of the lake and

included (beside the Academy locality) excavations by the Los Angeles High School and the University of California. The Los Angeles Museum still later reworked some of the old diggings and sank a new shaft in the center of the lake as well. Practically all material found at this time, however, was thoroughly rotted by contact with water. None of the bird material in the Museum collections, and referred to in this paper, was taken in this area.

The depression left by the commercial and scientific excavations covers an area of roughly 150 by 350 feet. A good portion of it still contains considerable seepage of asphalt, covered shallowly with water and bordered here and there with tules, giving the appearance of a pond or small lake, in which small birds are even now frequently entrapped. The situation may have been similar during the Pleistocene, with the greater asphalt accumulation producing a more effective trap. Such a situation, though possibly attractive to diving birds on sight, would not be expected to bring the fish-eating forms in any large numbers. The evidence supplied by the avifauna fits into this picture. Three species of typical deep-water birds are scantily represented, the swan and two members of the Nyrocinae. All other species are such as would be attracted to shallow ponds or marshes.

The discrepancy in the number of falconiforms in the Academy pit is due largely to a lesser number of individuals of *Aquila chrysaëtos*. Why this should be, it is difficult to explain. The other large eagles are well represented, including two individuals of the rare *Wetmoregyps daggetti*, hitherto taken in but two other excavations (L. A. Museum pit 4, and a University of California locality). There is a decrease also in the number of cathartid and teratornithid vultures, though less marked than with the Golden Eagle. This may possibly be accounted for by the habits of the vultures in the matter of approaching their food, walking up to it, rather than alighting upon it. The presence of water thus would be a deterring factor. There can be no doubt that this pit contained as old a fauna as any other Rancho La Brea locality. With the exception of *Cathartornis gracilis* (a rare species) and *Euphagus magnirostris* (a passerine) every extinct species recorded from Rancho La Brea is present in the Academy material.

Mention has been made of a few species occurring in the Academy collection which have not been recorded from Rancho La Brea before. These species, together with several other unrecorded species from the Museum collections, are listed here.

Podilymbus podiceps. Femur no. F5741 from L. A. Museum pit 16. This record is in addition to the humerus recorded by Miller (Carnegie Inst. Wash. Publ. 349, 1925, p. 71) as *Colymbus* ? sp., with the remark that it might be found to belong rather with *Podilymbus*. I have carefully checked this humerus, also, and find it definitely to belong to *Colymbus*, though I will not attempt to make the species identification.

Butorides virescens. Tibiotarsus no. F1824 from Museum pit 61.

Casmerodius albus. Tibiotarsus no. F560 from Museum pit 67, and coracoid no. H3695 from Museum pit 28.

Cygnus columbianus. Carpometacarpus and femur from the Southern California Academy excavation, and possibly tarsometatarsus no. G6273 from Museum pit 81.

Chen hyperborea. Identified from femora and tarsometatarsi from the Academy material and pit 4, and may be present in other Museum pits as well. Identifications are based upon characters defined by Alden Miller (MS). Two specimens measure 93.5 and 94.5 mm. in length, thus exceeding the longest available *C. h. hyperborea* or even *C. h. nivalis*. Possibly this species, like others noted in the Rancho La Brea deposits, attained a larger size in the Pleistocene than now.

Chen rossi ? Several tarsometatarsi in the Museum collection, similar in character to the above, but of smaller size, are tentatively assigned to this species. However, the size variation of *hyperborea* may have included these smaller specimens.

Anabernicula minuscula. This species was described as *Branta minuscula* by Wetmore (Proc. U. S. Nat. Mus., 64, 1924, pp. 6-7, figs. 3-4) from a proximal end of humerus taken in Upper Pliocene (Lower Pleistocene) beds near Benson, Arizona. According to communication

with Dr. Wetmore by letter, paleontologists are not in agreement regarding the age of these deposits. See also: Hay, Carnegie Inst. Wash. Publ. 322 B, p. 10. Twenty humeri in the Academy material and three from pit 16 are similar to this species. To determine this fact, comparisons were made with a cast of the type, for which I am indebted to Dr. Wetmore and the United States National Museum. To clear up one or two questionable points which the cast could not show, Dr. Wetmore kindly compared a representative series with the type itself. He concurs in the opinion that the Rancho La Brea bones are *minuscula*.

In addition to the humeri there are several coracoids, ulnae, carpometacarpi, femora, tibiotarsi and tarsometatarsi too small to be assigned to any living species of goose, and unlike any species of duck. These may undoubtedly be assigned to the same species as the humeri. The tarsometatarsi, however, are identical with the newly described species from McKittrick, *Anabernicula gracilenta* (Ross, Trans. San Diego Soc. Nat. Hist., 8, 1935, pp. 107-114, text figs. 1-6). We appear to have, therefore, a single species described under two different names from separate elements, an occurrence which cannot always be avoided in dealing with isolated fossil specimens. We are fortunate in this instance, however, in having in the asphalt material this large series of small goose-like bird bones, including nearly all of the principal skeletal elements. A study of this assemblage leads to but one conclusion: that a single species is represented.

The possibility of relationship of *gracilenta* to *minuscula* was noted by Ross, though he evidently considered the difference in age of the deposits too great to admit of identity. He says (*op. cit.*, p. 111): "*Branta minuscula*, described by Alexander Wetmore from a proximal half of a humerus, presents characteristics which might be expected in humeri of *A. gracilenta*. If the geologic position of *Branta minuscula* is Upper Pliocene, as determined by J. W. Gidley, considerable difference in age prevails between these two similar forms from Arizona and Southern California."

Regardless of age, however, the bones from Rancho La Brea and the type of *minuscula* are alike, remarkably alike considering the great variability which exists within one species among the anserines. I do not feel that so striking a similarity can be disregarded just because there appears to be a discrepancy in age. On the basis of our present knowledge, therefore, I can see no alternative but to assign the asphalt species to *minuscula*, in which case *gracilenta* must fall into synonymy.

Regarding the generic status of this species, the characters of the tarsometatarsus as given by Ross (*op. cit.*, pp. 108-109) are certainly sufficient to warrant the erection of a new genus. This fact I have found to be indicated by several of the other elements of the skeleton, as well. Even the humerus, as studied from the larger series now available, shows differences from *Branta*. It seems proper, therefore, to accept the new genus name of *Anabernicula* for the species *minuscula*, and it is here so recorded.

The largest representation of this species is from the Academy excavation (135 specimens representing fifteen individuals) with scattered specimens in a few of the Museum pits.

Querquedula, sp. Several specimens in both Academy and Museum collections.

Nyroca valisineria ? A tibiotarsus, coracoid and carpometacarpus from the Academy excavation appear to belong either to this species or to *N. americana*. Available specimens of the latter, however, are too small. Another species of nyrocine duck is also present in the Academy material, represented by a coracoid and humerus smaller than *Nyroca marila*.

Egretta thula ? Several specimens from the Academy excavation compare favorably with this species, though with scanty comparative material it is impossible to make definite distinction between this species and *Florida caerulea* and *Hydranassa tricolor*. A tarsometatarsus from Museum pit 61 was previously recorded as *Florida caerulea*? (Howard, Condor, 31, 1929, p. 251). This may possibly belong to the same species as the bones in the Academy pit, though it seems proportionately somewhat more slender.

Buteo lagopus. Two tarsometatarsi and a femur from the Academy excavation. I have been unable to find this species in the collection from the Museum pits.

Buteo regalis. Well represented in both Academy and Museum pits.

Fulica americana. Tibiotarsus no. F142 from Museum pit 4.

Squatarola squatarola. Several specimens in the Academy and Museum pits.

Capella delicata. Several humeri from Museum pits 3, 16 and 67.

Totanus melanoleucus. Several specimens from both Academy and Museum pits.

Limosa fedoa ? Tarsometatarsus no. G4907 and tibiotarsus no. F8504 from Museum pit 28, and tibiotarsus no. F451 from pit 3, resemble this species closely, and size equals large specimens in skin collection. Both fossil and comparative material is incomplete, however, so identification is tentative.

Recurvirostra americana. Five specimens from the Academy excavation. In addition to the

shorebirds indicated, there are at least three more species of small size present in the combined Academy and Museum collections.

Rissa tridactyla ? A coracoid from the Academy excavation compares perfectly with a modern specimen of this species, but in view of the overlapping which occurs among the species of gulls, the identification is tentative.

Larus brachyrhynchus ? A humerus, no. G647 from Museum pit 16 previously mentioned by Loye Miller (Condor, **32**, 1930, p. 117) as *Larus* sp., is found to coincide with *brachyrhynchus* in size.

Cryptoglaux acadica. Tarsometatarsus no. K1180 from Museum pit 36.

The following species which were previously recorded tentatively are now definitely identified.

Anser albifrons. Several very stocky tarsometatarsi and femora in the Academy and Museum collections are undoubtedly of this species. Judging from size, the full range of the species from *A. a. albifrons* through *A. a. gambelii* is represented.

Anas platyrhynchos; *Nettion carolinense*. Well represented in both Academy and Museum pits.

The status in the Los Angeles collections of species which have been recorded from University localities since the last general review of Rancho La Brea birds (Miller, L., Carnegie Inst. Wash. Publ. 349, 1925, pp. 63-106, 6 pls., 20 text figs.) is as follows.

Spatula clypeata ? (Miller, A. H., Condor, **31**, 1929, pp. 223-224). Unidentified specimens similar in size to the Shoveller, found in both the Academy and Museum material, may be of this species.

Oxyechus vociferus (Miller, *loc. cit.*). Found in Academy pit and Museum pits 16 and 36.

Numenius americanus (Compton, Condor, **36**, 1934, pp. 221-222). Found in Academy pit and Museum pits 61, 67 and 37.

Phaeopus hudsonicus (Compton, *loc. cit.*). Found in Academy pit and Museum pit 28.

Limnodromus griseus (Miller, *loc. cit.*). Found in Museum pit 16.

Astur atricapillus (Compton, *loc. cit.*). Found in Museum pit 16.

Asyndesmus lewis (Miller, *loc. cit.*). Found in the Museum collection, pit unknown.

Los Angeles Museum, Los Angeles, California, September 18, 1935.

FROM FIELD AND STUDY

Clark Nutcrackers Invade Southwestern Utah.—Between August 15 and October 1, 1935, there occurred an invasion of Clark Nutcrackers (*Nucifraga columbiana*) into southwestern Utah that was so noticeable as to be observed by many persons who had never seen the species, although it is fairly common in higher portions of this area. The more noteworthy of these observations are here listed.

August 15 to September 15. Large flocks were seen and reported frequently at Cedar Breaks National Monument, and at other points on the Markagunt Plateau within a radius of ten miles, from 9000 to 11,300 feet altitude. One observer estimated 200 individuals in one flock. Before and after the influx an observer would be fortunate to see over 20 individuals in a day.

September 1 to 10. During this period the Nutcracker population of Bryce Canyon National Park was apparently twice as great as normal, and the birds were much tamer than usual. Bryce is 35 miles east of Cedar Breaks and about 2000 feet lower.

September 16 to 21. Several Nutcrackers were seen by Wilbur Long in Zion National Park, in what is known as the "mountain sheep country" at an approximate elevation of 6500 feet. These were the first Nutcrackers seen in the park since 1932.

September 23. A single Nutcracker spent most of the day at the horse corrals, 4275 feet, in Zion Canyon. It was accurately described to the writer by Walter Beatty, cowboy guide, who had never before seen such a bird. These horse corrals are approximately 26 miles south from Cedar Breaks.

September 20 to October 1. At the Blake Ranch, on the south end of the Pine Valley Mountains, a small cornfield was invaded by over 100 Nutcrackers. They ate a considerable quantity of corn, in spite of some shooting by the man in charge of the ranch. He had lived in the vicinity for over 20 years, but had never before seen Nutcrackers. There was none on

the ranch when I visited it on October 11, but I found a few on the 10,000 foot summit of the mountains, apparently resident there. The Blake Ranch is 32 miles west of Zion Canyon.

September 29. At St. George, 2800 feet, a single Nutcracker was seen and collected by Floyd Atkin, a student at Dixie Junior College. St. George is 58 miles southwest of Cedar Breaks, and 14 miles south of the Blake Ranch. It is in the Lower Sonoran Zone.—C. C. PRESNALL, *Zion National Park, Utah, November 2, 1935.*

Some CCC Activities in Yosemite Valley.—It has been said, I believe, that Satan finds work for idle hands to do. Since the CCC army moved into Yosemite Valley many species of bird and beast have reason to believe that Satan has been looking about for idle hands, and with more or less success. With the advent of this army there was inaugurated in Yosemite Valley a clean-up campaign. Dead trees were cut down, dead wood was removed from living trees, and in and about the New Village much mistletoe was cut from the oaks.

Such work as above mentioned necessarily affected certain species of birds. California Woodpeckers (*Balanosphyra formicivora bairdi*) naturally suffered the most, as much of the work was done in their age-old haunts. Two pairs of Red-shafted Flickers (*Colaptes cafer collaris*) that formerly nested in the oak grove, finding their homes destroyed, moved away. The California Woodpeckers, however, rather than leave their beloved oaks drilled new nesting holes in what appeared to be live wood.

With the removal of dead trees the Hairy Woodpeckers (*Dryobates villosus*) have taken to the telephone poles. By drilling their nesting holes just under the cross arms of the poles, the Hairy Woodpeckers are afforded as much protection from the weather as they would have been under normal conditions with their nest holes on the under sides of leaning cottonwoods.

The Brewer Blackbirds (*Euphagus cyanocephalus*) and the Western Tanagers (*Piranga ludoviciana*) that formerly nested in the mistletoe bunches were not greatly affected, as they simply moved back into the conifers to build their nests. The tanager, however, is a poor nest builder and a tanager nest in a pine or fir is not nearly so secure as when placed in a clump of mistletoe.

Woodpeckers, blackbirds and tanagers were forced to seek new nesting sites, a matter of great inconvenience, perhaps, but not necessarily fatal to their cause, for, after all, other nesting sites were to be found. But what about the Sparrow Hawks, the small owls, and such small mammals as chickaree and flying squirrel that commonly nest in old woodpecker holes? Will these animals preempt by force of arms the newly drilled nesting cavities of the woodpeckers or will they seek a land beyond the reach of CCC activities?

And then there is the question of food supply. Every dead tree and branch cut down restricts the feeding range of some certain bird. Also the removal of mistletoe will force the bluebirds and other berry-feeding birds to seek new pastures.

If Satan, or the landscape engineers, would just go a step farther and add a bird box to the landscape every time a tree is cut down, they would make the landscape even more artificially attractive and at the same time do the birds a good turn. Of course the bird boxes should be made of glass! A glass bird box hung low would have high educational value, for then the inquisitive visitor to the Park could learn in intimate detail of the family affairs of nesting birds. And too, exotic berry-bearing shrubs might be introduced in artistic groupings to compensate for the missing mistletoe berries!

Real naturalists might not approve of such a program, but real naturalists are few and the people are many. Surely the National Parks are for all of the people and so why not make them as "attractive" as possible, now that the devil is finding so many idle hands.—CHAS. W. MICHAEL, *Yosemite, California, June 17, 1935.*

Avian Ocean Hitch-hikers.—On May 25, 1935, the Iota Kappa Nu Society of the Los Angeles Junior College chartered a small boat for an excursion to Catalina Island to observe birds. En route to the island and about one-half mile from San Pedro, we observed a San Diego Song Sparrow (*Melospiza melodia cooperi*) flying westward about twenty-five yards from the starboard side of the boat. We watched it for some time and noted that it gradually approached the boat and finally perched half-way up on the rope ladder leading to the top of the mast. It was content to ride for the major part of the trip, alternating its perch at intervals between the top of the mast and the rope ladder. When we were within half a mile of Avalon, it left the boat and continued its flight toward the island.

During the rest of the day we observed several Song Sparrows in and about the shrubbery at the Catalina Aviary and at other points near Avalon. In the evening, about 6 p. m., upon returning to the Hotel Saint Catherine float where our boat was waiting, one lone Song Sparrow (race?) was observed hopping about near the end of the pier. Perhaps it was our "hitch-hiker." Who

knows? Song Sparrows have been recorded as probable migrants from the mainland to Catalina previously, by Meadows (Condor, **36**, 1934, p. 40). A twenty-two mile flight over water by a bird of such localized habits as a Song Sparrow, it seems to me, is unusually long, and it may be that small boats travelling to Catalina Island play a large part in aiding these birds in their offshore pioneering, as recorded here.

The "hitch-hiker" recorded above recalls a similar incident to my mind, in which a California Yellow Warbler (*Dendroica aestiva brewsteri*) figured. It was on May 30, 1927, on the annual excursion of the San Diego Society of Natural History to Los Coronados Islands, off Lower California. Shortly after leaving San Diego Harbor, several members of the party observed a Yellow Warbler flying a short distance from the boat. The bird was seen at intervals for some time, maintaining approximately the same speed as our launch, about eight knots per hour. After we were nearly five miles offshore, the warbler approached the boat and finally perched on the roof of the pilot's cabin. There it rested for half an hour or so and then took to flight again. Three times it rested on the boat during the trip. The last time it flew off, about two miles from Corpus Christi (North Coronado Island), it increased its speed of flight and soon was lost to sight beyond the bow of the boat toward the island.—JACK C. VON BLOEKER, JR., *Museum of Vertebrate Zoology, University of California, October 16, 1935.*

Sage Hen Breeding in California.—In my collection there is an egg of the Sage Hen (*Centrocercus urophasianus*) collected, April 25, 1916, at Fort Bidwell, Modoc County, California, by M. French Gilman. The egg was infertile and was in a nest at the base of sagebrush. Young had hatched in the nest. It is believed that this is the first record for eggs of the Sage Hen in California.—WILSON C. HANNA, *Colton, California, September 21, 1935.*

Two New Records for Arizona.—The Arkansas Goldfinch (*Spinus psaltria psaltria*) and the Nevada Cowbird (*Molothrus ater artemisiae*) have not to my knowledge been previously recorded from Arizona. Specimens of both of these races are in the Museum of Vertebrate Zoology at Berkeley, California. I am grateful to Dr. J. Grinnell for identifying the specimens and to Mr. James O. Stevenson for his part in collecting them.

An adult female Arkansas Goldfinch (no. 67447, Mus. Vert. Zool.) was collected from a group of about twenty birds by Stevenson on July 4, 1934, from the mountain willows and narrow-leaved cottonwoods of the high Upper Sonoran Zone, 3 miles south of Springerville, 7050 feet, Apache County. This was evidently a breeding bird, as it contained a large egg in its oviduct. Another adult female (no. 67448, Mus. Vert. Zool.) was taken by the writer from a group of five birds on the same day in the narrow-leaved cottonwoods on Blue River, seven miles north of Blue Post Office, 34 miles south-southeast of Springerville, 6250 feet, in Greenlee County. The vegetation at this locality was an intermingling of both Upper Sonoran and Transition plants.

Although the number of specimens taken is limited, it seems probable that the common breeding subspecies of "green-backed" goldfinch throughout the Upper Sonoran Zone, at least on the north and east slopes of the White and Blue mountains of east-central Arizona, is *S. p. psaltria*. It appears, therefore, that the range of this subspecies extends westward to eastern Arizona, the territory formerly thought to be occupied by *S. p. hesperophilus*.

An adult female Nevada Cowbird (no. 67425, Mus. Vert. Zool.), was taken by Stevenson from a group of four birds on July 7, 1934, in the sagebrush and willows of the Upper Sonoran Zone, 3 miles south of Springerville, 7050 feet. This was evidently a breeding bird since a large egg was found in its oviduct.

There are many sight records of cowbirds from the vicinity of Springerville, and it is likely that *M. a. atemisiae*, whose range extends southward into east-central Arizona, is the breeding form in this region north of the White Mountains.—RANDOLPH JENKS, *Arizona State Museum, University of Arizona, Tucson, September 15, 1935.*

An Early Estimate of California's Fauna.—In Grinnell's "A Distributional List of the Birds of California" (1915), the following statement is made in the introduction: "Apparently the first attempt to catalog all the birds known at any one time from California was made by Dr. James G. Cooper in his unsigned contribution to Cronise's *Natural Wealth of California* (pp. 448-480), published in 1868. A brief running account is there given of 353 species." With this statement fairly clear in my memory, my attention was naturally caught by an entry along similar lines that I chanced to stumble across in a publication of earlier date than the one cited above. This is not a catalogue of species, however, merely a numerical estimate of the California fauna, including birds.

In the Proceedings of the California Academy of Natural Sciences, volume III, 1863, pages 23

to 29 are occupied by a communication from Professor J. D. Whitney on the progress of the Geological Survey of California. On page 27 appears the following statement and table: In the zoological department—in charge of Dr. J. G. Cooper, who has been employed about half the time since the survey was commenced—the annexed table gives a succinct idea of what had been accomplished, up to the close of the year 1862, in the way of collecting.

	Number of species in the collection	Of which there are new to California	Believed to be new, or undescribed	Other Californian species not yet collected	Total number credited to California	Of which there are found east of the Mississippi
Mammalia	32	10	3	45	77	14
Birds	170	28	4(?)	150	320	141
Reptiles	36	6	3	9	45	0
Fishes	58	16	16	75	133	0
Mollusca	335	123	123	65	400	0(?)

—H. S. SWARTH, *California Academy of Sciences, San Francisco, October 10, 1935.*

Unusual Sets of Bush-tit and Green Heron.—On April 15, 1935, while on a trip through the willows of Del Rey tide flat near Los Angeles, my wife and I found a nest of the Coast Bush-tit (*Psaltriparus minimus minimus*) containing 15 eggs. As this was an unusual set, we took particular pains to search the immediate vicinity for any disengaged individuals, or pairs not already nesting, but without results. The event was duly recorded "with reservations" until every element of doubt was eliminated. A week of watching failed to disclose any other birds than the one pair claiming the nest. The parents deserted the set after the 3rd day, no doubt, because of our continued presence in the vicinity. The nest and set were then taken and are now in our collection.

We were a little hesitant in reporting this find until, on May 4, we located a new nest, presumably of this same pair, some 60 feet from the old site. This nest contained 11 eggs, all well-incubated. On account of pressing business matters, we were unable to follow up this last set to see just how the parents handled the brood to maturity. It certainly would have been interesting to have observed how the parents kept fifteen or eleven young supplied with food.

There can now be no doubt in our minds that these two sets were laid by the same pair, and that both sets are unusual. Dawson states (Birds of California, 2, 1923, p. 628) that *P. m. minimus* lays from "5 to 8, usually 7". In over 100 nests I have examined previously, 7 eggs comprise the largest set found.

On returning to this same swamp one week later (May 11) to make a nesting survey of Anthony Green Herons (*Butorides virescens anthonyi*), a nest of this species, apparently an old one, was discovered 25 feet up in a large willow and placed some eight feet out. Although we had seen a green heron fly from the tree, we were inclined to pass it up, for only rather insecure footing was available to reach it. However, my wife, who is considerably lighter built than myself, made the climb and found the "old nest" overflowing with ten eggs, the bottom sagging so badly that it was a miracle just how it held, especially with the additional weight of the parent bird. While attempting to get the camera in position for a shot, there was an ominous report. The limb on which the nest was located, and upon which my wife had put too much pressure, snapped at the trunk—and I found myself suddenly smothered in an avalanche of limbs, camera, eggs and wife.

When the "dust settled," I found that, by some miracle, I had made a despairing dive for the nest as it descended and saved it from being dashed to bits. However, the bottom came out even as I lowered it to the ground and eggs were scattered everywhere. *Yet not one egg was cracked.* A reason was discovered when they were blown. The shells were too thick to drill by the ordinary method, so I used a large darning needle to puncture them.

As there were only four pairs of Green Herons nesting in this area (and each pair had its own nest), there is no doubt in our minds that this is a legitimate set, laid by one female. In examination of over forty nests of this heron, we have never found more than five, the average set being of four eggs.—L. B. HOWSLEY, *Los Angeles, California, October 10, 1935.*

Large Set of California Jay.—A number of years ago I was surprised to find a nest of the California Jay (*Aphelocoma californica californica*) containing six young birds. It was in a juniper tree on the Mohave Desert, about forty miles from Colton. Since then diligent search has been made for a nest containing such a large number of eggs or young, and on April 21, 1935, I found one containing seven eggs. This nest was in a juniper two feet from the ground and so

close to a road that the automobiles kept the foliage on one side worn down. The nest was within a foot of my car as it stood on the road. The eggs were almost at the point of hatching but there were only six large young in the nest two weeks later. This is the largest set of this jay that I know about.

My records from southern California indicate that four eggs to the set are the most common, thirty-five per cent being of this number; either three or five are also common, while two are not rare. The average weight of forty fresh, or almost fresh, eggs was 5.996 grams, and the extremes were 6.85 and 5.10 grams. The brown type of egg is rare as I have seen but a single set in the field. The extremes of nesting dates which I have are April 6, 1919, four eggs, and May 31, 1931, five eggs; the average date is April 26.—WILSON C. HANNA, *Colton, California, October 22, 1935.*

Remarks Stimulated by Brodkorb's "Two New Subspecies of the Red-shafted Flicker".—Mr. Pierce Brodkorb recently (Occas. Papers Mus. Zool. No. 314, Univ. Mich., May 29, 1935) has given names to the Red-shafted Flickers of the Rocky Mountain region and of northwestern Mexico. To take up the two names in order of their appearance, there is *Colaptes cafer canescens* with Bear Lake, Idaho, as the type locality and an ascribed range, speaking broadly, which includes the Rocky Mountains and adjacent areas to the east and west.

Now this area is, of course, on the edge of the meeting ground of the species *Colaptes auratus* and *Colaptes cafer*, a circumstance which is not even mentioned in the paper referred to! An analysis of the characters which are given as diagnostic of *canescens* shows that, in part at least, they may well be accounted for by an *auratus* influence. Briefly, there is the grayer pileum obviously an *auratus* tendency, the grayer back (concerning which see the comment by Ridgway on page 22 of Part 6 of the Birds of North and Middle America), and the more pinkish sides (in part, at least, *cafer cafer* or partly *auratus*). The "longer wing" is a matter of an average of three millimeters (less than 2 per cent), with the maximum (175 mm.) given as the same for both "races" (*collaris* and *canescens*). The claim of broader bill is not supported by any measurements.

Now it is not the intention of these remarks to enter into a discussion of the merits of recognizing, by name, a "new" flicker from the region of intermingling between *cafer* and *auratus*. The case has been exhaustively discussed by several eminently competent writers, a list of whom may be found in the cited volume of Ridgway. It is simply my contention that no description of a red-shafted, or any other, flicker from the Rocky Mountains region is entitled to serious consideration unless the author re-opens and gives careful analysis to the whole problem. In this connection, also, there are two old names, *Picus ayresii* Audubon, and *Colaptes hybridus* Baird, to be disposed of before any new ones are manufactured.

The case of the second description, *Colaptes cafer chihuahuae*, differs considerably from the foregoing in that the only question involved is a difference of opinion on how far to go in naming intermediates. The writer recently had occasion to investigate in considerable detail the geographic behavior of Red-shafted Flickers in central and northern Mexico and at that time came to the conclusion that there were increasing tendencies toward *mexicanus* from the Arizona border southward to Durango, but that there was insufficient stability of characters in this area to justify the bestowal of a name. However, he has not the slightest objection if anyone else desires to take such action.—A. J. VAN ROSSEM, *Pasadena, California, September 20, 1935.*

Additional Bird Records from Death Valley.—A summer, that of 1935, spent in Death Valley, California, brought to light several new bird records which are listed here.

Aix sponsa. Wood Duck. Two seen September 28 on a pond formed by overflow water from the Furnace Creek Ranch.

Mycteria americana. Wood Ibis. One seen at the same pond on July 30. Seen again the two following days at the same place and was very tame, allowing me to approach as near as ten feet. On the morning of August 2, I found the bird dead at the edge of the water. I found no marks of violence on it, so disease probably caused its death.

Egretta thula. Snowy Egret. Four seen August 21 at the pond. At the same time there was a flock of 26 Avocets. Two more of the Egrets were seen at the same place on August 31, one on September 1, and two on September 5. At one of my visits to the ponds I saw a flock of eight of the big American Egrets.

Lobipes lobatus. Northern Phalarope. July 1, two were seen swimming on the pond, and on August 6 two more were seen on the same pond.

Tryngites subruficollis. Buff-breasted Sandpiper. One seen on July 1 on the pond so often mentioned here. There were two overflow ponds about 100 yards apart and the sandpiper was seen for the next four days at one or other of the ponds. When flushed it would fly to the other pond. Before it left it became much tamer and would allow a reasonably close approach.

Asyndesmus lewis. Lewis Woodpecker. September 11, one was seen perched on a post on the border of a date grove at Furnace Creek Ranch. September 28 three were seen in the mesquite trees about half a mile north of the Ranch. The next day the three were eating dates in the grove, and from that time on during most of October, I would see from five to sixteen in the grove eating the dates. Three were seen on one occasion eating from the same bunch of fruit, while two others were at work on two other bunches in the same tree. The last one noted was on November 1 when a solitary bird was seen flying toward the range of mountains to the east. I might say that the Red-shafted Flickers (*Colaptes cafer collaris*) were much in evidence in the date grove at the same time, eating the fruit, some of them from the tree and some the fallen fruit from the ground. I counted twenty of the Flickers in the grove on one occasion, and fifteen or more was a quite common number. In September one bright yellow-shafted one was seen among them.

Tyrannus tyrannus. Eastern Kingbird. July 16 one was seen catching insects on an alfalfa field at the Ranch. It perched on a small tree on the irrigating ditch on one side of the field and from there made short dashes for insects. Though the tree was not large the bird paid no attention when I walked beneath it.

Nucifraga columbiana. Clark Nutcracker. September 11, one was seen about two miles north of the Ranch flying from the direction of the Panamint Mountains toward the Funeral Range. October 11, I saw one in the date grove but did not see it feeding. This season the Nutcrackers were exceedingly numerous in the Panamint Mountains, as many as forty being in sight at once.

Cyanocephalus cyanocephalus. Pinyon Jay. Three Pinyon Jays were seen near the ponds on September 5. Two days later three, possibly the same ones, were seen flying toward the Funeral Mountains.

Spinus pinus pinus. Pine Siskin. November 14, six Pine Siskins were seen near the "Old Harmony Borax Works," about two miles north of the Ranch. They were feeding on seeds of the desert sunflower and paid little attention to my car.

Sitta carolinensis. Slender-billed Nuthatch. One was seen at work October 12 on the trunk of a date tree at the Ranch.

Ixoreus naevius meruloides. Northern Varied Thrush. October 31 and November 1, two were seen feeding on the ground in the date grove. I could not determine what they were eating. On the same two days there were two Cedar Waxwings on the ground; their food was plainly fallen dates.—M. FRENCH GILMAN, *Death Valley, California, November 16, 1935*.

Are Condors Extinct in Lower California?—During a two weeks journey into Lower California, I and Robert, my eighteen-year-old son, failed to see any Condor (*Gymnogyps californianus*). We spent seven days on the Sierra San Pedro Mártir between August 20 and 27, the best time, according to residents, for seeing the birds. We rode and hiked four times across the mountain, from the high Encantada peaks to La Grulla and up and down the mountain for 50 miles or more. We carried binoculars around our necks and were always on the lookout for Condors, whether we rode, fished, watched, or fried beefsteak. What was more significant and disappointing we failed to find a single person who had seen a Condor in 1935.

A heartening contrast to this experience was a sojourn in the Santa Barbara National Forest, September 14 to 17, inclusive, during which we saw Condors every day, three at once for several hours, and a pair within a hundred feet.

From what we saw and heard on the San Pedro Mártir, the chosen home of Condors in Lower California for the last quarter century, we concluded that the Condor of Lower California is nearly extinct. As to the reason, let the reader judge from the evidence below.

For one thing, the food supply has been decreasing since the World War. The number of cattle anywhere on the Peninsula during the last decade is scarcely one-quarter to one-third what it was the previous decade. For ten years, until 1935, drought has devastated the country. Deer on the San Pedro Mártir have been almost exterminated by indiscriminate killing of bucks, does and fawns at all seasons, by cattle disease, and by lions. Probably the Condor has been caught between two fatal fires—starvation and slaughter. Young Condors, tame and confiding, have been murdered as a pastime to furnish gold-dust receptacles; old ones, only a little less wary, harassed, have, through age or accident, given up the losing fight. Thus apparently ends another tragic chapter in the history of the California Condor.

Consider these facts: Around our camp-fire the first night sat two persons who had killed three Condors in four years. Phil Melling, aged thirteen, shot a young bird in 1932, in a pine tree twenty feet from him with a .22 rifle. The reason given was that the bird looked neither like a buzzard nor a Condor and Phil wanted to have a close-up. A contingent reason was indicated in the carcasses of half a dozen red-tailed hawks, ravens and buzzards thrown back of the woodpile

of the ranch house. The other person was one Antonio, a cattleman of the mountain, who shot a Condor in 1933 and another in 1932. He said the birds spread disease among the cattle, but he sold all the quills to prospectors. Multiply Antonio and Phil by two or three and the years by two or three and we have a good clue to the Condor situation on the San Pedro Mártir.

That is what the Mellings told us—Salve, Adolph, his brother, and Mrs. Bertie, wife of Salve—all intelligent, trustworthy outdoor people, cattle raisers, residents of San Pedro Mártir every summer and acquainted with Condors for more than twenty-five years: All agreed that Condors have been getting scarcer and scarcer since about 1920; that twenty-five years ago you could see 20 to 30 Condors any summer day where there were dead cattle; that they have never seen Condors at any time away from the San Pedro Mártir (they knew of other people who had seen them in the Sierra Juarez); that they have seen none for the last few years except that Salve saw his last one in 1932 when Griffing Bancroft, according to Salve, vainly tried to bait a bird with a dead horse and that Adolph saw two in July, 1934, for two days at Encantada meadows and a lone one later in the summer on one occasion.

On August 23 and 24 we rode from the Melling ranch at Encantada, where we were camped, to the San Pedro Mártir Mission, 18 miles south. En route we camped over night in the Santo Dumas Flats, about 6000 feet altitude, situated about two miles west of Santa Rosa meadows. It was at Santo Dumas Flats that E. W. Nelson saw twelve Condors in 1905, at the carcass of a donkey, as told in his Memoirs of Lower California, page 22. There were six vaqueros at the same old shack. They told us that Condors used to come to the flats every summer to feed on dead animals. They had seen no Condors for four years except a lone one last summer. We scared several ravens and about thirty buzzards from a roosting place in a group of pines but no Condor.

Some of our informants told us it was a poor year to see Condors because, on account of the excellent season, there were no dead animals. But for three years before 1935 cattle died like flies. But there were no Condors at the great festal boards. In truth there are always a few dead animals wherever there are cattle. We scared a dozen Turkey Vultures from a carcass in La Grulla meadows. According to their habit the cowboys fired revolvers at the birds. Our conclusion was that every year was a bad year for Condors in the Sierra San Pedro Mártir. Nothing is protected on the Peninsula. How could such a tempting target as a Condor escape!

[Since writing the above, word comes that Salve Melling saw "one lone Condor in La Encantada about November 5, eating on a calf that had died. It is the only one seen this year."]—Carroll Dewilton Scott, *San Diego, California, November 18, 1935.*

The Clark Nutcracker in Extreme Southwestern Arizona.—A young Clark Nutcracker (*Nucifraga columbiana*) was observed by us October 22, 1935, at Bates Well in Growler Pass, western Pima County, Arizona, altitude approximately 1600 feet. Another individual was observed on the Lechuguilla Desert, altitude about 1000 feet, near Tinajas Altas, southern Yuma County, on October 23. Both birds were seen in mid-day, and each was alone. The Bates Well bird was at a water trough, whence it flew into a nearby mesquite and permitted us to approach within fifteen feet, appearing to be hot and tired. The temperature was estimated to be, at this time, 85 or 90 degrees. The Tinajas Altas bird was seen in an ironwood or mesquite on the way between Cabeza Prieta and Tinajas Altas.

The nearest mountain country in any direction from which these birds could have come is probably at least 100 miles away. The Bates Well bird, judging from a faint mottling on its breast, was a young individual. Its features and plumage generally were in excellent condition. The area where these birds were seen is of an extreme desert type, with creosote bush (*Larrea tridentata*), *Franseria dumosa,* and palo verde (*Parkinsonia microphylla* on the hillsides, and *Cercidium torreyanum* in the washes) prominent in the flora.

These occurrences are of some interest in view of the reported invasion of Clark Nutcrackers in the Cuyamaca Mountains of San Diego County this fall (Natural History Museum Bulletin, San Diego, California, No. 108, November 1, 1935). According to this bulletin Nutcrackers are now (apparently late in October, 1935) quite common throughout the Cuyamaca region. It seems possible that there is this year a somewhat more widespread wandering than usual of this interesting species.—Walter P. Taylor, *U. S. Biological Survey, Faculty Exchange, College Station, Texas,* and Charles T. Vorhies, *University of Arizona, Tucson, Arizona, November 8, 1935.*

Donald R. Dickey's First Bird Photograph.—The picture here presented is believed to be the first bird picture ever taken by Donald R. Dickey. It happened in this manner. We were schoolmates at the Thacher School in the Ojai Valley, Ventura County, California, in 1904-

1905. Edgar Park and I had the pernicious craze of collecting eggs, albeit we collected "scientifically." We were hunting gnatcatchers' eggs among the stunted sycamores in a dry wash behind the school. We stumbled upon a Poor-will's "nest" consisting of the two squabs cuddled among the pebbles. I ran back to school and asked Donald whether he would take the picture. He would try, but had never taken any bird pictures before. (See fig. 7.)

Fig. 7. First picture taken by Donald R. Dickey; in 1904-1905, of Poor-wills in Ojai Valley, California.

The next time I saw Donald, after leaving school, was on the "Tanager" expedition where old acquaintances were renewed and delightful new ones with Alexander Wetmore, D. Thaanum and others were made.—CHAPMAN GRANT, *Maj., U. S. A. Ret., San Diego, California, November 8, 1935.*

Flammulated Screech Owl in the Sacramento Valley.—A Flammulated Screech Owl (*Otus flammeolus*) was taken from the roof of a hen house on the University farm at Davis, Yolo County, California, on October 31, 1935. The specimen, an adult female, is now in the collection of the Division of Zoology of the University of California College of Agriculture at Davis. Measurements are as follows: wing, 135.8 mm.; tail, 63.5; culmen (from cere) 9.65. The ovary was double; the right lobe was only slightly smaller than the left.

The present specimen, coming from a central point in the Sacramento Valley only 45 feet above sea level, furnishes apparently the first lowland record of this species in California.—JOHN T. EMLEN, JR., *Davis, California, November 22, 1935.*

Red-shafted Flicker Foraging on a Cement Pillar.—The fact that the Red-shafted Flicker (*Colaptes cafer collaris*) may depart from its typical habit of foraging in and beneath trees and shrubs and on open meadows was demonstrated to me on November 1, 1935. I was astonished to see a flicker fly up to and perch on the face of one of the fluted, cement columns or pilasters on the southwest side of the Life Sciences Building, University of California Campus. Here, approximately 60 feet above the ground, the bird clung in typical flicker manner—body parallel to the long axis of the column, feet grasping the substrate, tail braced against the cement—for approximately two minutes. Then it began to shift up the face of the pillar and to probe and peck with its bill into crevices in the cement, evidently gleaning insects. It continued its foraging tactics and movement upward until it attempted to progress across the face of one of the "cement bovine skulls", a molding on the frieze on this side of the building. Here the footing must have been poor, for the bird slipped backward, flew downward a few feet, then upward to a ledge, coming to rest momentarily before flying away.

Time of day, 12:45 p. m.; lapse of time for observation, 5 minutes; weather cloudy, slow rain falling.

At a later date, under similar weather conditions, examination of the cement at the base of the column revealed the presence of numerous small ants, which were crawling over the face of

the structure. Since it is known to bird students that flickers often eat ants, it is possible that these insects, serving as a food supply, attracted the bird mentioned to the building.—EMMET T. HOOPER, *Museum of Vertebrate Zoology, Berkeley, California, November 16, 1935.*

The Black and White Warbler in Marin County, California.—A Black and White Warbler (*Mniotilta varia*) was picked up dead on September 6, 1935, by Margaret Dean in Murray Park, Kentfield, Marin County, California. It was in good condition, apparently just killed, though it was cold. Miss Dean took the bird to her instructor at the Marin Union Junior College where it now is, in the collection there. Dr. Paul T. Wilson, of the faculty, made the skin and later brought it to me. He was unable to determine the sex, but we thought it this year's bird.—ANNA MARGARET SMITH, *San Anselmo, California, October 10, 1935.*

Observations Upon the Night-roosting of an Anna Hummingbird.—I was watching the quail going to roost at sunset on October 26 in a small live oak about fifteen feet from the west window of the living room of my house in Piedmont, California. An Anna Hummingbird (*Calypte anna*) darted into the scene and alighted upon a thin, dead twig of the adjoining tree, not more than five or six feet from the noisy quail, about eight feet from my place at the window, slightly lower than the floor of the room and perhaps eight or nine feet above the ground. It seemed probable that this was the hummingbird's night roost; and, from time to time, until about ten o'clock that night, a flashlight was directed at the point and the hummer was seen each time, placidly occupying the roost, facing the window and apparently undisturbed by the beam thrown upon it.

The perching twig was in a very exposed location on the end of a drooping branch, the canopy of the tree itself being but thinly disposed. Except for the presence of the house to the east, the bird was exposed to all the winds that blow. There was no protection from rain and predators and it could be plainly seen from all directions. On the whole, it did not look like a good place for a hummingbird to roost. But the next night the bird was again on exactly the same twig and was observed at intervals up to eleven o'clock that night.

The bird was elsewhere the next four nights, but back again on October 31. November 1 was somewhat stormy and the roost was unoccupied; but from the 2nd to the 15th, inclusive, there were only two nights on which the hummer was not seen roosting upon the same twig. Since then the twig has not been used as a night roost, although Anna Hummingbirds are buzzing about the garden as usual during the day.

From this limited series of observations on but one individual, one is not, naturally, warranted in attempting generalizations. Nevertheless, it is at least clear that we have here an example of one solitary-roosting bird that returned repeatedly to the same roosting place, and it seems probable that its night-roosting habit follows a pattern similar to its day-perching behavior, but with song, preening and watchfulness omitted. There is at least one resident Anna Hummingbird at this place (perhaps the same bird) that usually, when at rest in the day time, selects one of about seven known preferred locations. All of these places are within an area which would be circumscribed by a circle of about fifty feet diameter. For several days in succession one of these places will be occupied almost to the complete exclusion of all others; then a shift will be made, and so forth indefinitely. This action has extended over a period of several years and, it is thought, involves the same individual.

On three occasions a watch was kept on the night roost to determine the time of arrival of the bird with reference to sunset, and on each occasion the sun's disk was either bisected by the western horizon formed by the hill-tops of San Francisco, or else it had disappeared in the same instant that the bird alighted.

The procedure was simple in the extreme: First, a bare twig; then a whir; then a lump about the size of a small walnut miraculously appeared on the twig where nothing had been before. The bird invariably faced the window with its back to the sunset point; there was nothing unusual in its posture and while it may have put its head "under its wing", it was not seen in that attitude. A caged bird of the same species, nursed back to normal and just released by a friend who received it from a lady who found it incapable of flight in her driveway, was under observation for several weeks and was not seen to place any portion of its head beneath its feathers.—ERNEST I. DYER, *Piedmont, California, December 4, 1935.*

Abundance of Red-breasted Nuthatches in Southwestern Utah.—Coincident with an abundance of Clark Nutcrackers reported from various localities, the writer observed a great influx of Red-breasted Nuthatches (*Sitta canadensis*) into the higher portions of southwestern

Utah in September and October, 1935. This influx was made more noticeable by the facts that the region had been practically devoid of this species during the two previous years of my observation there, few were recorded there in 1931 by Miller (Wilson Bull., **46**, 1934, p. 163), and all observers from the time of Henshaw in 1872 had rated it as uncommon or rare.

The beginning of the influx was first noted on September 6, 1935, when three individuals were seen at Rainbow Point, 9105 feet, Bryce Canyon National Park. This, incidentally, was the second record of the species in Bryce. Three days later, while unsuccessfully hunting conies on the Sevier Plateau some twenty miles north of Bryce, Red-breasted Nuthatches were found to be quite common between 8000 and 10,000 feet. On September 18 the first record of the species in Zion National Park was made, when several were seen on the East Rim, about 6300 feet.

Maximum numbers were noted by the writer and W. S. Long at Cedar Breaks National Monument, 10,000 to 10,700 feet, between September 30 and October 3, no observations being made immediately before or after those dates to determine whether or not that was the actual peak period. On September 30, especially, the forests of Engelmann spruce and alpine fir were literally alive with nuthatches. Four males were collected by Long. Previous to that time I had heard but one individual at Cedar Breaks, and Miller had recorded none. A gradual diminution in numbers was noted as the season advanced. On October 10 and 12 there were few at Bryce and Pine Valley Mountains; and from October 19 to November 4, Long reported a scarcely appreciable decrease at Cedar Breaks.—C. C. PRESNALL, *Zion National Park, Utah, November 27, 1935.*

Late Nesting of Six Species of Montana Birds.—Despite a cold, backward spring, the earlier nesting birds in this mountain valley in 1935 began activities at about the usual time. For some reason, however, some first- and many second-brood nestings occurred unusually late in the season. The following records obtained near Fortine illustrate this unusual condition.

Perdix perdix perdix. European Partridge. Eleven eggs of a clutch of fourteen hatched July 31. Another brood of young, hatched at about this same time, was observed a week later. Three additional broods raised in the same locality, numbering respectively fifteen, sixteen, and twelve young, were hatched early in July.

Iridoprocne bicolor. Tree Swallow. Two of the sixteen pairs of Tree Swallows that nested in birdhouses about my home raised two broods of young in 1935. The nestlings of one brood first took wing August 10; of the other, August 11.

Turdus migratorius propinquus. Western Robin. My Montana records covering the past fifteen seasons contain dates on 231 nests of the Western Robin. The last nest shows the latest seasonal date: the three eggs of a set were deposited July 18, 19, and 20, 1935, and the young birds left the nest August 14. This species regularly produces two broods of young each season here.

Sturnella neglecta. Western Meadowlark. A brood of young left their nest July 20. This is the latest nesting for the Western Meadowlark that I have recorded in Montana. Two broods are normal in this locality.

Pooecetes gramineus confinis. Western Vesper Sparrow. The young birds of one nest observed in 1935 hatched July 19; those of another nest hatched July 25.

Junco oreganus montanus. Montana Junco. The first egg of a late 1935 set was laid July 2. Previous late dates for this species near Fortine are these: the eggs of one nest hatched July 14, 1927; young birds left a nest July 25, 1934.—WINTON WEYDEMEYER, *Fortine, Montana, December 8, 1935.*

NOTES AND NEWS

The eleventh annual meeting of the Cooper Ornithological Club will be held in Los Angeles, Friday to Sunday, April 17 to 19, 1936. The regular sessions will convene at the Los Angeles Museum, Exposition Park. Special features at at this meeting will be illustrative materials. The committee of arrangements urges immediate response as to availability of moving pictures or slides of birds, to be presented in person or lent for the occasion. In this regard, correspondence should be undertaken at once with the chairman of the committee, Wright M. Pierce, Box 343, Claremont, California. It is none too early to make plans for attending, and especially for contributing to the program either pictures or papers or both.

It is a satisfaction to be able authoritatively to announce substantial progress toward appearance of further volumes in Bent's Life History

series. Since Bulletin 162 relating to the gallinaceous birds was published, manuscript for two additional volumes, on the birds-of-prey, have been prepared. At least one of these is likely to appear during the coming year. Now the author is at work on still another volume, the twelfth, which will deal with the birds from the parrots to the hummingbirds, inclusive, these in the old check-list arrangement. The assistance of many contributors of information to the preceding volumes has been invaluable. It is customary for contributors to receive each a copy of the volume containing matter from his pen. Notes on habits, and photographs, relating to the birds to be treated of in volume twelve, will now be welcomed by the author, Mr. Arthur Cleveland Bent, Taunton, Massachusetts.

A serious mistake occurred in our last issue for which we are humbly sorry. The block, figure 50 on page 267 (vol. XXXVII, November, 1935) was printed upside down! Really, the young Black Swift, as photographed, was *hanging* by one foot to the face of the cliff. That the change occurred in the print shop after we saw page-proof does not altogether excuse us. We hold ourselves responsible, in that we should have called to the special attention of the shop foreman anything that might appear out of the ordinary, and which hence might prompt the seeming need for "correction." Never can an editor completely conceal himself behind the rather common and complacent excuse, "printer's mistake"!—J. G.

Word comes from M. J. Delacour, Secretary for the Ninth International Ornithological Congress, to the effect that the time and place for this World meeting has been set for early May, 1938, at Rouen, France.

A commendable bird list, from a new locality, is C. C. Presnall's "The Birds of Zion National Park" (Utah Academy of Sciences, etc., Proceedings, XII, 1935, pp. 196-210). Reprints of this article may be had for 25 cents each from the Park Naturalist, Zion National Park, Utah. A total of 140 kinds are here listed, on conservative basis. The author makes some apt introductory comments, well worth quoting (in indirect form): An attempt has been made to satisfy both the scientific and popular interests which inevitably center upon any national park. The scientist will no doubt find his interest whetted rather than satisfied, since little collecting has been done even in the region as a whole. Many of the forms listed are designated as to species only, trinomials being used only when actual specimens are available.—J. G.

MINUTES OF COOPER CLUB MEETINGS

NORTHERN DIVISION

SEPTEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on September 26, 1935, at 8 p. m. in Room 2503, Life Sciences Building, Berkeley, with President Miller in the Chair and 57 members and guests present. Minutes of the Northern Division for August were read and approved. Minutes of the Southern Division for August were read by title only. Charles G. Danforth, 607 Cabrillo Ave., Stanford University, California, was proposed for membership by Mrs. Alice B. Addicott, and Sherwin F. Wood, 855 North Vermont Ave., Los Angeles, California, by Mr. Jean M. Linsdale.

The secretary quoted from a letter written by Miss Grace E. Nichols of Sonoma County reporting the residence of a pair of White-tailed Kites in that county, and Mr. Tom Kirksey told of a locality in Marin County where one of these hawks is to be seen. Mr. George Haley described a nesting of the eastern Chickadee in the Maine woods where specks of Canada balsam were placed all around the nest entrance in a dead poplar tree, at some distance from any place where the balsam could have been obtained, and said that he had been told by three different woodsmen that they sometimes found Chickadee nests so guarded, but not always, seeming to class this habit as an individual rather than a racial one. Mr. Leslie Hawkins contributed the record of a Crow seen on the University Campus, just below the Life Sciences Building, which perhaps presages an invasion of this species, so common on the Marin peninsula.

Mr. Knox Borden who has spent the past two summers in the Chiricahua Mountains of Arizona told of the reported absence of Band-tailed Pigeons from that region for some years past until their re-invasion this last nesting season, when the birds were plentiful, both in the oak belt and the pine forests higher up. Mr. Kinsey announced the sending of five Anna Hummingbirds and a pair of Pileolated Warblers by airplane to Chicago. Mr. Paul Covel recalled the field note by Mr. and Mrs. McCabe in a recent *Condor* describing the attack upon a gull by one of the resident Canada geese at Lake Merritt, and he stated that such attacks were of almost daily occurrence and were always perpetrated by the same individual goose. Miss Amy Rinehart reported seeing and hearing a Mockingbird at Lake Chabot on September 2, and Mr. Henry Fitch the observing of a partial albino White-crowned Sparrow at Lake Merced on September 8, the bird having a white throat-

patch and some white wing feathers, conspicuous in flight.

Mr. James Moffitt presented the evening's program, an illustrated talk upon "California-breeding Canada Geese." Since this very informative paper is soon to be published in its entirety no digest of the speaker's findings will be attempted in these minutes. The general discussion, following, betokened the lively interest Mr. Moffitt's observations and conclusions had aroused.

Adjourned.—HILDA W. GRINNELL, *Secretary*.

OCTOBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on October 24, 1935, at 8 p. m. in Room 2503, Life Sciences Building, Berkeley, with President Miller in the Chair and 55 members and guests present. Minutes of the Northern Division for September were read and approved. The untimely death of Harry S. Swarth, one of the most eminent members of the Cooper Club was announced by President Miller, and a committee composed of Mr. Linsdale, Mr. Dixon and Miss Werner was appointed to submit appropriate resolutions at the next meeting.

Mr. Charles G. Thompson told of observing in his yard for several days last spring a White-crowned Sparrow which had had its left leg broken. Two weeks ago one was noted with its left foot missing. This may have been the same bird previously seen. Mr. Tracy I. Storer reported a mockingbird at Davis imitating a kingfisher. Mr. Miller called attention to the fact that a mockingbird has apparently taken up residence on the Berkeley Campus. It was first noted on October 4, in the bushes near Hilgard Hall. For several mornings afterward it sang regularly and has been noted off and on since.

Mr. William B. Davis and Mr. William H. Behle both reported observations on a crow which seems to remain around the area west of the Life Sciences Building. Mr. Brighton C. Cain announced that he has been daily observing Golden-crowned Kinglets in the pines near the Scout Camp east of Oakland. Mr. Ernest I. Dyer told of several California Jays mobbing a Screech Owl near his home in Piedmont. He seemed to hear a Steller Jay also taking part, but upon investigation it proved to be his Thrasher uttering a note new to his known repertory.

Mrs. Junea Kelly called attention to the fact that conditions are now favorable for observing shore birds along the Bay shore at Alameda, especially at low tide. Mr. Paul Covel commented upon the great number of Egrets he recently observed at sloughs between Los Angeles and San Diego. At one place he counted thirty Snowy Egrets and only six of the American Egrets and said that usually the American Egrets are the more abundant. Mr. Miller read several observations reported by Mrs. Otis H. Smith from Marin County. Mr. Storer stated that for several years past, about ten days or so before the normal influx of Gambel Sparrows, he has heard a few individuals uttering notes, usually from high in tree tops or on wires. He wondered whether these could be early migrants since all later ones were to be seen on the ground. Mrs. Kelly reported that she too has noticed a few individuals coming early but they were often on the ground. Miss Amy Rinehart called attention to the fact that October 20 was the Centennial Anniversary of the coming to California of Thomas Nuttall, one of this country's earliest ornithologists and botanists.

The speaker of the evening was Mr. John T. Emlen, Jr., of Davis., who spoke on "The Night Roosting Habits of Some Birds." Drawing upon his own wide experience and also the literature, such topics were discussed as where birds spend the night, their sleeping postures, when birds sleep, soundness of their sleep, effect of eclipses on birds, and gregarious roosting habits of certain birds. This extensive treatment dealing with many kinds of birds occasioned considerable discussion after the talk.

Adjourned.—WILLIAM H. BEHLE, Secretary *pro tem.*

NOVEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on November 21, 1935, at 8 p. m. in Room 2503, Life Sciences Building, Berkeley, California, with President Miller in the Chair and 45 members and guests present. Minutes of the Northern Division for October were read and approved. Minutes of the Southern Division for September were read. The committee appointed by President Miller at the October meeting presented the following resolutions:

Whereas, during nearly the whole existence of the Cooper Ornithological Club its members have been accustomed to depend upon Harry S. Swarth, not only for help in managing the affairs of the Club, but also for friendly personal guidance in questions dealing with natural history, and for the results of painstakingly thorough studies in the systematics of birds, and

Whereas, Harry S. Swarth, in addition to having the friendship and respect of our local members, has a wide circle of admirers gained through correspondence and on his many trips to other countries, and

Whereas, the death of Harry S. Swarth, on October 22, removed one of our most valued members, therefore

Be it resolved, that the members of the Northern Division of the Cooper Ornithological Club hereby express our recognition and appreciation of the many benefits we have received from his life, and our grief from our loss, and

Be it resolved further, that a copy of these resolutions be placed in the records of the Club and that a copy be sent to the family.

Signed: Selma Werner, Joseph S. Dixon, Jean M. Linsdale.

Mr. John T. Emlen reported seeing a Flamulated Screech Owl at the University Farm at Davis on October 31. Mr. G. C. Thompson reported Cedar Waxwings in Berkeley on November 21, the date of the meeting. Mr. Walter Moore reported seeing a Western House Wren in the Hotel Claremont grounds on November 2 and a Turkey Vulture elsewhere on November 9. Mrs. Amelia S. Allen stated that a Western House Wren has been frequently seen in Strawberry Canyon during the past month and a Western Gnatcatcher in her garden on November 21; also that after the storm which occurred early in the month, Black Turnstones, approximately a thousand in number, were to be seen on the salt pools near the eastern approach to Dumbarton Bridge.

Mr. Jack Sturgeon told of finding a Burrowing Owl in his yard at Hopkins Street and Fruitvale Avenue, and Mr. George Stillwell reported seeing an American Egret at Snelling, Merced County, on August 8. Greater Yellow-legs, about 40 in number, were seen by Mrs. Hillebrand near Dumbarton Bridge the second week in November.

Mr. John B. Price of Stanford University was the speaker of the evening and his subject was "The Family Relations of the Plain Titmouse." Mr. Price recounted a series of interesting facts which he had gathered in his study of the life histories of many pairs of these characteristic inhabitants of the live oaks native on the Stanford Campus. The discussion which followed the talk brought out the need for identification tags plainly visible at a distance for use on individual birds under observation in the wild. Mr. Emlen mentioned that in some studies colored celluloid bands have been superseded by contour hen-feathers stained with diamond dye and fastened with Dupont cement onto the head or tail of the bird being watched.

Adjourned.—Hilda W. Grinnell, *Secretary*.

SOUTHERN DIVISION

September.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at 8 p. m., on September 24, 1935, at the Los Angeles Museum, Exposition Park, Los Angeles, with President Cowles in the Chair and 32 members and guests present. Minutes of the Southern Division for August were read and approved. Minutes of the Northern Division for August were read. The application for membership of Dr. H. C. Nichelsen, 920 South Broadway, Tacoma, Washington, was proposed by Mr. John McB. Robertson.

In order that tentative program plans for the December meeting might be completed, and because the last Tuesday in the month falls this year on New Year's Eve, and the preceding Tuesday on Christmas Eve, the Chair asked for suggestions from the floor. Tuesday, December 17; Monday, December 23; Friday, December 27; Monday, December 30, were suggested; but definite decision was waived until the October meeting. The death of Mr. Jesse H. Taylor, a member of the Club since 1919, was brought to attention. On motion by Mr. Pierce, seconded by Mr. Glassell, the Secretary was asked to write a letter conveying to Mrs. Taylor the sincere sympathy of the Southern Division.

Dr. James J. Parsons, with a small outline sketch showing relative positions of some Black-chinned Hummingbirds' nests, told how he had discovered that it was possible to distribute hummingbirds from one nest to another and know they would be well taken care of. During the past summer he had systematically changed fledglings back and forth, taking care to place the birds as far as possible in nests with others of the same age. Young birds had been taken to his home, subjected to hand feeding, then returned the next day to the nest for natural feeding. In one instance, a Black-chinned youngster was placed in a nest with a Costa fledgling and fed by its foster parent without any apparent notice being given to the substitution. Dr. Parsons also offered for observation further evidence of the Black-chinned Hummingbird using lichens for nest decoration.

President Cowles reported seeing a single Frigate Bird near the pier at La Jolla this summer, and a flock of 21 Wood Ibis in the back country near Lake Hodges. He also gave a short account of his unsuccessful efforts to secure pictures of four Condors feeding on the carcass of a cow near Sandbergs. Mr. Roland C. Ross spoke of the augmented food supply in the Sierra Nevada this year due to insect infestation among the pines. Crossbills were feeding almost exclusively on the larvae. Mr. Wright M. Pierce reported a scarcity of pinyon nuts in the San Bernardino mountains. This may account for the Pinyon Jays being seen in the lowlands this fall.

Dr. Louis B. Bishop having just returned from a motor trip to New England said he had encountered very few birds along the way. Starlings and Purple Martins were common in Wisconsin, but other species were not at all abundant. It is his impression that birds everywhere are decreasing enormously. A few of the interesting returns of banded birds, printed in "Bird Banding Notes" for August, 1935, were read by the secretary.

Adjourned.—Laura B. Law, *Secretary*.